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## FURTHER EXPERIMENTS ON THE INHIBITION OF SENSATIONS

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§ 1. *Introduction.*—Inhibition may be defined as the reduction of any conscious activity while the stimulus is in operation and undergoes no corresponding diminution. The reduction may be either partial or complete, but must not be due to fatigue. This definition is strictly empirical, and is designed to cover all past work in the psychological field. We may add that while the loss may conceivably be of intensity, extent, or any other attribute, each type needs to be experimentally demonstrated.

Examples of inhibition of intensity were reported in a paper of last year (Psy. Rev., Jan., 1911). It was concluded that sensations of certain types, at least, may have a diminished intensity owing to the presence of certain other sensations. We found that this kind of inhibition was dependent upon the attention of the subject: when he was trained to increase his attention to pressure sensations, for example, these were no

longer inhibited by the sound sensations; and when, on the other hand, he increased his attention to the sounds, these diminished the pressure sensations most markedly.

In order to learn whether these results could be extended, I undertook more experiments last year at Cornell University. The observers were Miss Mabel E. Goudge (graduate student), Mr. E. G. Boring (assistant in psychology), Mr. A. S. Edwards (graduate), and Mr. C. A. Ruchmich (present instructor). G and B worked three hours per week and E somewhat less during both terms; R gave this number of hours during the first term.

## PART I

### *The Effect of (Strong) Auditory Sensations on the Intensity of Simultaneous Odors*

§ 2. *Procedure.*—The sounds were made with an electrical buzzer placed near the left ear, and were thus of fairly constant character. With an olfactometer the odor stimuli were varied in strength at will. (See Appendix, § 1.) Also we needed to measure the intensities of the odor sensations, and our way of doing this may be explained as follows: We choose two stimuli, S and C, and find the number of times out of eight that C is called fainter than S. Now it is evident that the weaker a sensation is, the more times will it in the long run be called weaker than a certain constant other one with which it is compared. Therefore, if the sensation from stimulus C given with the sound is more often called weaker than when given without the sound we may conclude that the sound has reduced the intensity of the sensation of C.

Accordingly we give our odors in pairs,—S-C and S-C (with sound). Two more pairs arise upon changing the order,—C-S and C (with sound)-S. In Table I are shown the various strengths of the odors used for each observer. For Observer B what we have just called S appears as the figure 11, while C is represented by 3 and again by 18. Thus we plan to find the number of times out of eight that 3 is called fainter than 11, when the former occurs with and also without the sound. Similarly with 18 and 11. We have stated this method of calculation at greater length in the previous paper.

The way of getting the odors was this: The signal 'Ready!' came first, followed soon by 'One!' when the observer placed his nostril over the opening of the tube and inspired; next he removed the nostril and awaited the second signal, then took the second odor and said which was stronger.

TABLE I.

| | Observer B | | Observer G | | Observer E | | Observer R | |
|---|---|---|---|---|---|---|---|---|
| | First Odor Given | Second Odor Given | First Odor Given | Second Odor Given | First Odor Given | Second Odor Given | First Odor Given | Second Odor Given |
| A | 11 | 3 | 7 | 3 | 8 | 3 | 10 | 3 |
| B | 3 | 11 | 3 | 7 | 3 | 8 | 3 | 10 |
| C | 11 | 3/*n* | 7 | 3/*n* | 8 | 3/*n* | 10 | 3/*n* |
| D | 3/*n* | 11 | 3/*n* | 7 | 3/*n* | 8 | 3/*n* | 10 |
| E | 11 | 18 | 7 | 11 | 8 | 13 | 10 | 17 |
| F | 18 | 11 | 11 | 7 | 13 | 8 | 17 | 10 |
| G | 11 | 18/*n* | 7 | 11/*n* | 8 | 13/*n* | 10 | 17/*n* |
| H | 18/*n* | 11 | 11/*n* | 7 | 13/*n* | 8 | 17/*n* | 10 |

In Table I are shown the various pairs of odors given to each observer. The figures stand for the strength of the stimuli, expressed in half centimeters of exposure of the odorous cylinder. The capital letters stand for the pairs of stimuli, e.g., the A-pair for Observer B is 11—3. The sign */n·* indicates the occurrence of the sound.

Experiments in this field of inhibition need to be carried out with great care, and we give in the Appendix a list of precautions which were observed. (See Appendix, § 2.)

§ 3. *Results and Discussion.*—Figures which show the intensities of odors as judged with and without the sound appear in Table II.

TABLE II.

| | | Observer B | | Observer E | | Observer G | | Observer R | |
|---|---|---|---|---|---|---|---|---|---|
| Series 1–A | | | | | | | | | |
| A | *C* | 6½ | 1½ | 5½ | 6½ | 6 | 6½ | 4 | 5 |
| B | *D* | 2½ | 2½ | 5½ | 5½ | 6 | 7 | 5 | 1 |
| A+B | *C+D* | 9 | 4 | 11 | 12 | 12 | 13½ | 9 | 6 |
| E | *G* | 3 | 1½ | 3½ | 3½ | 3 | 1½ | 0 | 4 |
| F | *H* | 2 | 2 | 1 | ½ | 2 | 2 | 0 | 1 |
| E+F | *G+H* | 5 | 3½ | 4½ | 4 | 5 | 3½ | 0 | 5 |
| A+B+E+F | *C+D+G+H* | 14 | 7½ | 15½ | 16 | 17 | 17 | 9 | 11 |
| Series 1–B | | | | | | | | | |
| A | *C* | 6½ | 3 | 7½ | 7½ | 6 | 8 | 5 | 7 |
| B | *D* | 5½ | 3½ | 6 | 6 | 7 | 8 | 1 | 3 |
| A+B | *C+D* | 12 | 6½ | 13½ | 13½ | 13 | 16 | 6 | 10 |
| E | *G* | 2 | 5½ | 3 | 1½ | 2 | 2½ | 4 | 0 |
| F | *H* | 1 | 3 | 1½ | | 1½ | 2½ | 1 | 1 |
| E+F | *G+H* | 3 | 8½ | 4½ | 2½ | 3½ | 5 | 5 | 1 |
| A+B+E+F | *C+D+G+H* | 15 | 15 | 18 | 15½ | 16½ | 21 | 11 | 11 |

TABLE II—*Continued*

Series 1–C

| | | | | | |
|---|---|---|---|---|---|
| A | *C* | 7½ | 6½ | 5 | *4* |
| B | *D* | 6½ | *6* | 8 | *4* |
| A+B | *C+D* | 14 | *12½* | 13 | *8* |
| E | *G* | 4 | *3½* | 5 | *4* |
| F | *H* | 0 | *1½* | 1 | *1* |
| E+F | *G+H* | 4 | *5* | 6 | *5* |
| A+B+E+F | *C+D+G+H* | 18 | *17½* | 19 | *13* |

Series 1–D

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| A | *C* | 4½ | *4* | 6½ | 7½ | 7½ | *7* | 6 | *3* |
| B | *D* | 6½ | *4* | 7 | *3½* | 5½ | *6* | 4 | *4* |
| A+B | *C+D* | 11 | *8* | 13½ | *11* | 13 | *13* | 10 | *7* |
| E | *G* | 4 | *2½* | 4½ | *4½* | 3½ | *3* | 3 | *0* |
| F | *H* | 2½ | *1* | ½ | *2* | 1½ | *0* | 7 | *0* |
| E+F | *G+H* | 6½ | *3½* | 5 | *6½* | 5 | *3* | 10 | *0* |
| A+B+E+F | *C+D+G+H* | 17½ | *11½* | 18½ | *17½* | 18 | *16* | 20 | *7* |
| Total sum | | 46½ | *34* | 52 | *49* | 69½ | *71½* | 59 | *42* |

Figures opposite single letters in Roman type (A or B or E or F) in each case represent the number of times out of eight that the odor from a certain stimulus was judged fainter than a certain other (see Table I); while in the space to the right of each such figure in Roman is a corresponding figure in italic which represents the number of times that the odor from the same stimulus was judged fainter than that from the same other stimulus when the sound was made simultaneously with the former. For any observer it will be seen that the italic figures are not generally nor in their sums (markedly) larger than the Roman; therefore the figures fail to demonstrate that the sound generally inhibited the odor.

The above figures, as explained in the note under the table, do not permit us to conclude that the sound sensation generally inhibited the odor. In fact, the odor with the sound seems rather to have had an augmented intensity.

The results were unexpected for two reasons: first, because they were unlike those attained in the previous experiments under similar circumstances, where pressures and sounds had been judged;[1] and secondly, because the observers at the beginning of the series had themselves occasionally mentioned the odor being blotted out or cut off by the sound.

Accordingly we needed to explain this difference. In daily life, as is well known, distractives often are overcome by increased effort to attend. More particularly, I have shown cases where pressures were robbed of the inhibitory effect they

[1] *Op. cit.*, Psy. Rev., Jan., 1911, §§ 4, 7, 18.

tended to have on sounds, when the subject attended to the sound as strongly as he could.[2] Indeed under these circumstances the sound sensation even seemed to be stronger than when it occurred with normal attention and no simultaneous pressure. These facts lead to the hypothesis that by added effort to attend to the odor when the sound came, the observers in the present series had counteracted the inhibitory influence of the sound, and so turned the scale as to result in a positive augmentation.

§ 4. *Introspections.*—Observers R and B had, in the work just described, spontaneously mentioned such effort to increase attention to the odor when the sound came; G and B each had done the same at least on one occasion. Partly in order to learn whether such added effort characteristically occurred with the sound under our conditions, I undertook to obtain a series of detailed introspective analyses of the situation. (See Appendix § 3.)

Of course the experimenter did not speak of effort to the observers. That would have been contrary to the policy of our introspective work, which requires that the observers be left to report on what they find without interfering suggestions. They were trained to give accounts of "everything that occurred in consciousness in temporal order" from the first signal to the utterance of judgement. Excerpts from these reports show how effort sometimes appeared when the sound came:

Observer B.—"Prolonged auditory sensation (from the buzzer). With it, I think, were kinaesthetic sensations in head and in back (meaning a brief, weak start). After this, but still with the auditory sensations, there came weak, unpleasant organic sensations (meaning disturbedness and *effort to image or sense the odor*)."

Observer G.—"Olfactory image or sensation, and simultaneous muscular sensations, principally in center of chest, and in the region of the nose and temples; also there were strain sensations in the chest and temples (those in the chest being due to holding the breath, and those in the temples perhaps due to holding breath, but also to *the purpose to keep out other stimuli than the olfactory*)."

Observer R.—"Kinaesthetic sensations in trunk, legs, neck, (movements to get odor) and scalpular sensations at the side of head and contracture sensations in forehead (concentration upon image of odor following). Meanwhile the image of odor and feeling of unpleasantness are present, but decrease toward the close."

The effort to attend, however, was only one of numerous kinds of effort which the reports mentioned and analysed: there also were efforts or strains to retain, judge, introspect, breathe, and listen for the experimenter's signal. Some one

[2] Ibid., Series 6, p. 48.

of these efforts was reported in each of most of the introspections, but the effort to attend failed to appear in very many of them, and furthermore, it often occurred during the tests in which the distracting sound was absent. These introspective reports, therefore, did not give adequate warrant to the conclusion that "added effort characteristically occurred with the sound under our conditions." (See above p. 349.) Nevertheless, they did give us positive instances of the occurrence of such effort, and we decided to test the matter further in the manner described in the next chapter.

## PART II

### *The Abandonment of Effort of Attention*

§ 5. *Methods.*—If the sound sensation in Series I was robbed of its inhibitory influence by special effort of attention on the part of the observers, we might expect, by doing away with this effort, to restore the inhibition. Plainly to tell them to avoid effort when the sound came seemed suggestive and unwise, and therefore the experimenter took a roundabout means. To each he first read a list of his past introspections, wherever they had mentioned effort, and then gave the following instruction: "Not to continue to exercise effort of any sort at any time during the entire process. To abandon all attitude of effort and be quite as passive as possible."

As it was necessary to learn how the instruction was working, in order both to understand and to control the situation, we made records not alone of the judgments about intensities, but of two other matters as well:

1. The observers gave introspective reports how the instruction was being carried out, telling especially of any effort that had been present. On some days they gave such an account after each eight judgments; on others, after the whole hour's work. Whenever any kind of effort was mentioned, the experimenter drew special notice to it, and suggested that it be abandoned.

2. The experimenter took records of the "behavior" of the observer.

It was plainly noticed that in this there might occur much variation: The observer's brows may be wrinkled, and his mouth compressed, or both may be smooth and expressionless; the muscles of his trunk and limbs may be alert and contracted, or they may be flaccid and inactive; he may breathe in the odors jerkily and utter judgment abruptly and vigorously, or may maintain the quietness of sleep and speak in a soft whisper; may talk in lively fashion, or may say practically nothing.

In short, he may be alert and tense in this or that part of the body, or may be inactive and relaxed.

Now it was found that with increase of effortlessness, as reported by the observer, there was an increase of relaxation and inactivity as externally manifested. Marked deviations were noted, but this correlation seemed to hold as a very rough, but fairly serviceable generalisation. And there seems to be a good reason why it should hold; for the observers all found that in order to carry out the *Aufgabe*, they had to 'relax'; and it is obvious that relaxation may be manifested in behavior as well as in introspection. In other words, effort is a psychophysiological condition which reveals itself not alone in certain mental processes (strain sensations, etc.), but in external behavior as well.

At first the records of behavior were taken sporadically, but later a system was developed. Then, as a rule, with every set of eight judgments the experimenter recorded the degree of (1) facial relaxation, (2) bodily relaxation, exclusive of the muscles concerned in maintaining the sitting posture, (3) jerkiness of respiration, (4) quietness of voice, (5) talkativeness. Sudden palpation was sometimes used to gauge bodily relaxation. The above particulars were each time recorded as of degree 0, 1, 2, 3, 4, 5, the last number representing the maximum. We give two examples, both of Observer E, the first taken when he had not yet had much practice in attaining effortlessness.—"The observer shakes his head, wrinkles his brow, and speaks in strong perplexed tones. He takes quick, irregular breaths, and his voice is no more calm than in Series 1." A record from a later time, when he had become better at the task, shows him much more relaxed and inactive, to-wit:

f = 4
b = 4
r = 1
v = 2
t = 0

This schema made it possible to take records very quickly. The observers were never informed of this, since we wished them to be spontaneous. When activity rather than quietness and relaxation was shown, the observer was specially instructed and urged, in general terms, to increase his attempts to get the effortless condition. (See Appendix, § 4).

The odors were given in about the same way as in Series 1: Upon signal the observer took a half-second breath from the tube, practice having made this habitual; after removing the nostril he awaited the second signal, which came three seconds after the beginning of the first inspiration; then he took another half-second breath and said which odor was stronger. The sound occurred in one-half of the tests either with the first or second odor. (See Table I; also Appendix, § 5.)

§ 6. *Results.*—We shall first quote from the records in order to trace how each observer did away with effort.

*Observer B.*—At first B stated that the effect of the *Aufgabe* had been to remove "nearly all those efforts that you described in reading those introspections" (see p. 350). Nevertheless, the immediately

subsequent reports, including all of those for the first three or four hour-sessions, speak of effort. For example: "Sensations of strain about the neck, also vague strain sensations in head and at times in body occurred noticeably before giving the judgment 'Equal,' and also during sounding of the buzzer, especially when this appeared prolonged—and occasionally when the odor was not sensed as soon as the nostril was placed on the tube. These strain sensations are the same as those which constitute the greater part of the feeling of effort. When the buzzer comes there is a feeling of uncomfortable tension, which is particularly marked if the sound is prolonged. It is the sort of feeling that always produces bodily strain. Perhaps that is due to my trying not to attend to it; I don't know." At this time also the signs of behavior do not indicate effortlessness; there are "quick, jerky movements away from the tube, and his utterances are somewhat jerky and abrupt." A little later we still find him saying, "The whole period of the sounding of the buzzer is very different from other periods. There is a strong, unpleasant affection, and a consciousness of the presence of a disturbing factor; I feel confused, disturbed, uncomfortable, as if in an unnatural situation."

Marked improvement soon sets in; the breaths remain jerky, and there is still some muscular tenseness, but the signs are generally quieter. We read, "Very little feeling of effort, if any. Strains in body, arms, neck, forehead, eyelids, and top of head vaguely noticeable; I believe these are always present in some degree if attention is turned to them; but they are very obscure and appeared only when the idea, 'Am I straining?' came into consciousness. ——— Judgments seem to come much more mechanically than usual, and I have a positive kinaesthetic 'feel' of relaxation ——." Relaxation (including the absence of strains localized in the brain) is stated by the observer to be equivalent to absence of effort (See Appendix, §6).

Improvement continues.—The muscles of face and body show a high degree of relaxation (degree 4, as a rule), respiration and voice are subdued, and talking is at a minimum. Reports read: "Felt perfectly passive," etc. "Seems to be no effort at all except very seldom.—Was conscious of vague pressures and strain—my self-consciousness, —but that is all." Indeed at this stage the observer has made so much progress toward passivity and effortlessness that he falls asleep at various times during the hour's work, especially at the pauses between the sets of eight judgments. Nevertheless the signals arouse him to go through the task and judge in mechanical manner. "The general dozing condition", he reports, "is made of distinct organic sensations in arms, legs and body (a definite, positive 'feel' of relaxation). There is a slight strain of different character in the back (meaning physical effort to hold the body in position relatively to the tube). The most intense sensations present come from the eyes, and are similar to the peculiar strains experienced when going to sleep; (these carry a meaning, 'My eyes are becoming closed,' entirely different from 'I am closing my eyes.' The former is very passive). Tactual sensations from weight of head on hand or other support (meaning relaxation) also are prominent. The whole of consciousness may be said to be rhythmical. Even breathing seems to be accompanied by rhythmic variations in the kinaesthetic complex.

"The acts performed in connection with smelling appear also to come rhythmically. Each one is preceded by vague visual and kinaesthetic images, which are followed by a slow motion whose time is felt kinaesthetically (image) beforehand. The motions following the

signals go off almost automatically. The verbal idea frequently appears 'I don't care what happens.' (The observer had been instructed that he need not concern himself about anything so long as he attains the desired state of effortlessness. He may even omit passing judgment if necessary.) This phrase is especially frequent when judgment does not follow immediately after the second stimulus.

"There are really two sorts of consciousness. In the dozing sort there is complete reverie. Consciousness does not lapse, but may lose all logical connection and all reference to the surroundings and the situation. At the first signal there is a feeling of 'heightening' of consciousness. By this I mean that I have a visual image of raising something up in my brain. There are also kinaesthetic images or sensations in the shoulders, and a slight feeling of restlessness and constraint carried by kinaesthetic sensations in the head. I have not called this effort in the past; it is too vague and uncertain, and is more of an attitude than a separable component. When judgment comes of itself I lapse immediately into a state of reverie with a few kinaesthetic changes. If judgment does not come at once, there is a feeling of suspense carried kinaesthetically in the chest and elsewhere and followed by judgment, or sometimes, in the event of failure to get judgment, by the utterance 'equal.'"

A final statement of the observer shows further how he did away with effort. "Effort is very likely to occur when the attention is not on the matter in hand, but may be inhibited, I think, for instance, by the phrase, 'I don't care what happens,' or 'I don't care whether I judge or not,' since in these last series I knew that if necessary, I did not have to bother to judge. Sometimes the idea 'I must not make any effort' increases effort. (Question: In attempting to abandon effort did you make any use of effort to attend positively to something else?) No! (with certainty) to attempt to attend positively to anything else means to me to attend with effort. On the other hand, I frequently did avoid effort by attention to something else, but the attention did not come voluntarily; there was no attempt to attend."

*Observer G.*—The first report reads, "Before the signal 'Ready' I was more relaxed (than in the previous series); did not thrust back any ideas trying to come in. After the signal things seemed to be as usual, except that there was muscular relaxation more or less all over, but especially in the head and temples; and in the period between the odors there was not such strain as usually occurs." From now on G typically gives a brief report, in which she compares her present condition with that of the previous series: "1. Greater muscular relaxation. 2. Ideas not relating to the task occurring in the fore- and mid-period were not actively thrust back. 3. I felt a 'tightening' at times, which I at once tried to banish." The reports for most of the periods practically are repetitions of the above, some of them omitting (3). (See Appendix, §7.)

As to behavior, moderate or good facial relaxation with deliberate breathing and subdued voice was attained, but there was more or less retrogression at times to the quick reactions that characterized the previous series. Towards the last the observer reported maximal relaxation, and at this time an average of four behavior records reads $f = 3$, $b = 3$, $r = 4$, $v = 3$, $t = 2$, showing a fair, but not an exceedingly high degree of external relaxation.

Asked for a brief and general account of how it felt to go through the process in the relaxed state, the observer replied, "Before the first signal I got the conditions, and remained more or less conscious of the

relaxation and calmness during the experiment; with these exceptions consciousness, so far as I remember, was the same as in the previous series." Her way of bringing about effortlessness, she added, was by keeping her hands from being clenched and tense, by eliminating strains from the head, and by making her body as limp as possible. Questioned how she 'banished the tightening' she replied that all she could say was that she just relaxed again; "It involved a consciousness of being tense, and that I must not be tense,—not verbally spoken, of course."

*Observer E.*—He discusses his first response as follows: "At first arose the verbal idea, 'relax!'; I found an easy position and tried to get as comfortable as possible; so far as I could I relaxed all muscles, then waited to let my ideas or sensations appear. Attitude was that of one ready to follow the impulse of the moment. I noticed the comfortable feelings of breathing and having eyes closed, and the pleasure which came from allowing my thoughts to arise without any effort, unlike the past." On the next day he adds that smelling and judging occurred quite mechanically. The behavior, however, does not indicate effortlessness and passivity, and special instructions to get this condition are repeatedly given. On the fourth day muscular relaxation sets in, though other signs are of normal activity; but his introspections do not change in tone. Various sorts of effort are reported at times, but usually the operations are called automatic.

Once he remarked, "The noise was very unpleasant. I did not set myself to overcome so much noise." Questioned as to the nature of this 'setting,' he replies, "First a consciousness (of the task, namely, to be relaxed as much as possible and still to smell and judge upon signal. This becomes relatively unconscious, and the appropriate act automatically follows the signal.)" At the time he was unable to analyse this consciousness. Later he speaks more definitely when asked, "What happens when the buzzer sounds?"—"Auditory sensations of noise, generally in the background of consciousness,—not much noticed. Muscular sensations in chest (from slight effort to overcome distraction caused by buzzer). Also organic sensations, not definitely localized, (but due to shock and intensity of noise). A slight tightening of diaphragm, I think, (also due to shock). There is rather more effort when the buzzer sounds, as shown by these muscular sensations, which are not so apparent without the sound." (See Appendix, §8.)

The factor whose presence we suspected is here plainly disclosed for this observer; and at this late date, when more than half the series is over, has not yet been banished. He had believed that he could not judge at all, if this effort during the noise were banished. Upon this the special instruction was given that he abolish it, and after some trouble he reports success. The typical report for the last part of the series is, "No effort recalled." (There is no corresponding decrease of activity shown in behavior, but rather a slight increase on the whole in muscular tone. However, the signs show a fair degree of relaxation and inactivity,—averaging f=3.5, b=4, r=1, v=2, t=.7.)

The records for the three observers may in summary be said to have seven essential elements in common: They find (1) various kinds of effort, and among these (2) special effort to attend when the buzzer sounds. (3) Effortlessness is

identified with relaxation, and (4) the state is brought on by self-imposed instructions such as "Relax!" or "I don't care what happens!" carried verbally or otherwise. Then (5) effort diminishes and external relaxation and inactivity increase, until towards the close of the series (6) a high degree of effortlessness is attained, and (7) the processes of smelling, attending, and judging become mechanical and automatic.[1]

For each observer, therefore, the attention to the odors finally becomes fairly passive and effortless, and special concentration to overcome distraction is probably abandoned.

How have the reported intensities of the odors thereby been affected? Turning to Table III, one is disappointed, if he has expected to find evidence that the sound now exerts a marked inhibitory influence. In the case of G it seems to have been inhibitory, as shown by the sums at the bottom of the table; but for B the effect, if any, has been small, while for E it has amounted to nothing.

Upon comparing Table III with Table II, however, it is seen that there is some difference. While the "Total Sums" in the latter for each observer excepting G show a decrease from left to right, that is, an augmentation of the reported strength of the odor, those in the former show no decrease, but rather a constancy or increase. Consistently with this, the increase (inhibition) for G in Table III is greater than the increase in II. It seems fair to conclude, therefore, that the decrease or augmentation in II probably was due to "added effort of attention in order to counteract the inhibitory influence of the sound," since upon removing this effort (at least partially at all stages) in Series II, that decrease disappeared.

However, the fact remains that the figures of the table do not demonstrate the general occurrence of inhibition of the odor sensation by the sound. We are reminded of the results of previous workers on distraction, who have failed to secure that condition under circumstances that made it expected. What makes our results almost astonishing, however, is that the inhibition did not occur when conditions were rendered so favorable.

We have attempted to carry out the conditions required for efficient distraction, as we previously defined them (*op. cit.*, p. 42). But it is possible that in one respect we somewhat failed. For upon exhalation through the nares a second olfactory stimulation sometimes causes a noticeable sensation, if attended, and this I did not take into account when I

[1] G does not mention points (2) and (7); this may be due to omission, since her reports in this series lack fullness.

TABLE III.

| | | Observer B | | Observer G | | Observer E | |
|---|---|---|---|---|---|---|---|
| A | *C* | 6 | 5 | 6½ | 6 | 7 | 7 |
| B | *D* | 4 | 6 | 5 | 7 | 5½ | 4 |
| A+B | *C+D* | 10 | 11 | 11½ | 13 | 12½ | 11 |
| E | *G* | 4 | 6 | 3 | 5 | 3 | 4 |
| F | *H* | 2½ | 2 | 1 | 4 | 1 | ½ |
| E+F | *G+H* | 6½ | 8 | 4 | 9 | 4 | 4½ |
| A+B+E+F | *C+D+G+H* | 16½ | 19 | 15½ | 22 | 16½ | 15½ |
| A | *C* | 7½ | 4½ | 6½ | 6½ | 6½ | 7 |
| B | *D* | 4½ | 4½ | 2½ | 6 | 6 | 5½ |
| A+B | *C+D* | 12 | 9 | 9 | 12½ | 12½ | 12½ |
| E | *G* | 4 | 4 | 1½ | 4 | 3½ | 4½ |
| F | *H* | 2 | 3½ | 2½ | 4 | ½ | 0 |
| E+F | *G+H* | 6 | 7½ | 4 | 8 | 4 | 4½ |
| A+B+E+F | *C+D+G+H* | 18 | 16½ | 13 | 20½ | 16½ | 17 |
| A | *C* | 6 | 5 | 7½ | 4 | 5½ | 6½ |
| B | *D* | 6 | 5 | 4½ | 5½ | 4 | 4 |
| A+B | *C+D* | 12 | 10 | 12 | 9½ | 9½ | 10½ |
| E | *G* | 5 | 5½ | 1½ | 3 | 2½ | 3 |
| F | *H* | 2 | 7½ | 1 | 1½ | 1 | 1½ |
| E+F | *G+H* | 7 | 13 | 2½ | 4½ | 3½ | 4½ |
| A+B+E+F | *C+D+G+H* | 19 | 23 | 14½ | 14 | 13 | 15 |
| A | *C* | 4 | 6½ | 6 | 7½ | ½ | 1½ |
| B | *D* | 6½ | 6½ | 4½ | 1½ | 6½ | 5 |
| A+B | *C+D* | 10½ | 13 | 10½ | 9 | 7 | 6½ |
| E | *G* | 4½ | 3½ | 6½ | 4½ | 4½ | 2½ |
| F | *H* | 4 | 1½ | 2 | 3 | 2 | 1 |
| E+F | *G+H* | 8½ | 5 | 8½ | 7½ | 6½ | 3½ |
| A+B+E+F | *C+D+G+H* | 19 | 18 | 19 | 16½ | 13½ | 10 |
| Total | *Total* | 72½ | 76½ | 62 | 73 | 59½ | 57½ |

planned the conditions. Nevertheless, there are two reasons for supposing it has not the greatest importance: first, since only one observer noticed it, and then said that it occurred but seldom; secondly, since we succeeded in getting inhibitions in Series III, as we shall presently describe, although the manner of exhalation remained the same.

We have not exhausted all resources for bringing about an inhibition of the odor by the sound. There remains one manner whereby we can increase the efficacy of this as an inhibitor to the maximum, and to this we now turn.

## PART III

### *The Inhibition of Olfactory Sensations by Strongly Attended Sounds*

§ 7. *Methods.*—Our aim was to learn whether the sound, when given the advantage of strong voluntary attention, would cause marked inhibition of the odor. If so, this would be like our previous results, where strongly attended sounds had inhibited pressure sensations, and conversely.[1]

To do this, we find the number of times out of eight that the sensation from stimulus C accompanied by a strongly attended sound is called fainter than the sensation from S; also we find the number when C is not so accompanied, but receives normal attention. Thus we learn whether the attended sound increases the number of times that C is called the fainter. This plan was followed with four strengths of stimulus in the rôle of C, as Table IV makes clear. For S a constant stimulus was used in all cases for each observer, and the sensation was always attended in the natural manner.

TABLE IV.

| | Observer B | | Observer G | | Observer E | |
|---|---|---|---|---|---|---|
| | First Odor | Second Odor | First Odor | Second Odor | First Odor | Second Odor |
| A | 5 | 9 | 5 | 9 | 5 | 9 |
| B | 10 | 9 | 10 | 9 | 10 | 9 |
| C | 14 | 9 | 14 | 9 | 14 | 9 |
| D | 18 | 9 | 18 | 9 | 18 | 9 |
| a | 5/*n* | 9 | 5/*n* | 9 | 5/*n* | 9 |
| b | 10/*n* | 9 | 10/*n* | 9 | 10/*n* | 9 |
| c | 14/*n* | 9 | 14/*n* | 9 | 14/*n* | 9 |
| d | 18/*n* | 9 | 18/*n* | 9 | 18/*n* | 9 |

The figures stand for strengths of stimulus. The sound is represented by /*n*. (In the last third of the present series we changed the strength of the second odor for Observer B from 9 to 6.)

Eight pairs of odors, along with repetitions, were given in succession, followed by a pause for rest. Before some sets the observer was told that the coming odors were to be compared and judged in the natural and ordinary manner; before other sets the instruction was as follows: "The sound will come with the first odor, and you are to put the most intense concentration you can on the sound. The second odor is to be attended in the ordinary way."

[1] Ibid., pp. 41-48.

§ 8. *Results.*—From the introspections we shall first quote accounts of the act of strongly attending the sound. Analysis shows that it involved various factors, differing from time to time.

*Observer B.*—"Concentration on the sound consists of clear auditory perception of the sound plus a visual image of the buzzer sometimes, plus kinaesthetic strains in head, ears, neck, sides of chest and elsewhere; probably also organic sensations in the trunk." So read his first report. He succeeded in carrying out the task from the start, excepting that at first he found that perfect concentration interfered with his withdrawing the nostril at the proper moment. He got rid of this difficulty by conceiving each time that the sound was caused to start by his act of placing the nostril on the tube, and caused to cease by its withdrawal.

Later on he adopts a similar device to help him attend to the sound. He will press on the table with his finger, he says, and the pressure will carry the meaning for him, "This is going to make the sound come." We can note the rôle of this and other elements in a report given at an advanced stage of the work. "In general, concentration on the sound came more easily than heretofore:—Auditory perception of the buzzer was clear sometimes, not very clear at others. There were kinaesthetic sensations in the right hand and fingers (meaning, 'I am pressing to make the buzzer sound.' The meaning just now was not so evident as it was earlier today, and has never been verbal today). The kinaesthetic sensations in the fingers last after the pressure sensations have become unclear, while muscular and kinaesthetic sensations in the chest, neck, left ear, cheek and shoulder (mean effort to attend to the buzzer; they also very vaguely mean the location of the buzzer, and occasionally become focal and mean 'I am leaning or trying to lean toward the buzzer'). Generally all these kinaesthetic and organic sensations are not very clear, though sometimes a particular one or a number of them stand out. When these are not clear, the clear process is either auditory sensations or visual image of the buzzer. Also there are very vague, never clear organic sensations in the head (which mean that the odor is present, but attended from,—like a feeling of bewilderment)." Much later we are told that the "pressure in the left hand is scarcely noticed any more, and occurs almost automatically, except after failure to concentrate." The factor is still mentioned at times in subsequent reports.

Of the period preceding the sound, an early report says: "I begin by calling up auditory images of the sound, and a visual image of the buzzer; the body is made tense, principally in the sides and back. In listening, strains of two kinds arise about the ears,—a sharper one on the pinna, and a duller and less intense one in the ear deeper than the external opening." Other reports show that all of these elements, excepting the auditory image, may also appear during the sound.

It is clear from the above analyses, as well as from many others which we have not the space to quote, that there are divers elements which enter into the act of concentration, namely:—

(1) Clear auditory perception of the sound. (See Appendix § 9.)
(2) Visual image of the buzzer sound.
(3) Auditory image of the sound.
(4) Kinaesthetic or 'strain' sensations about the ear (meaning attention to the sound).

(5) Kinaesthetic sensations in hand and fingers (meaning, 'I am pressing to make the buzzer sound').

(6) Tactual sensations, etc., (due to placing nostril on tube, and meaning that the sound will thereby be started).

(7) Kinaesthetic or 'strain' or 'organic' sensations in neck, trunk and limbs (mean effort to attend to the sound). (Appendix, § 10.)

(8) Organic sensations in the head and strains in upper parts of the trunk (effort not to attend to odor). (Appendix § 11.)

*Observer G.*—In the first report, in answer to the question, "What occurred when you concentrated on the sound?" it was said, "Muscular or strain sensations shifted from the region of the nostril to that of the ears. The sound stood out more in consciousness, as a rule, than the odor." Another report reads, "To get attention on the sound, I had strain sensations principally in and around the ears, especially the left. There were also strain sensations in the upper part of the head. These strain sensations were accompanied by the feeling that I must have my attention on the sound. Rarely the phrase, 'Sound!' or 'I must get the sound!' was present."

These reports, along with several others of similar tenor, do not enable us to enumerate as many factors as those for Observer B; certain other of her accounts mention various sensations due to tension in the arms, legs or trunk, but it is not made clear whether these are integral parts of the concentration on the sound or merely of the general attitude.

(1) Clear auditory perception of the sound.

(2) Muscular and strain sensations about the ear.

(3) Strain sensations in the temples or upper part of the head.

(4) Verbal idea, 'Sound!' or the like.[1]

[1] The *Aufgabe*, we are told in the first report, was kinaesthetically rehearsed before each pair, "a shorthand anticipation of the whole process to be gone through,—the clearest part being strain sensations in the ear, with the accompanying feeling that the sound was to come first in the experiment, and strain sensations in the nostrils, with the feeling that smelling was the second thing. Sometimes, there was internal speech, 'Sound—odor'. Soon the matter becomes more automatic, but some strain persists right along."

In the above list of elements or parts of the act of concentration, we do not include everything that appears in the *Aufgabe*-consciousness. Rather, we distinguish between act of concentration and *Aufgabe* to concentrate as we would distinguish between 'effort' and 'feeling that I must exert effort'; the latter may be mere intention. To be sure, the consciousness of *Aufgabe* often is more than mere intention,—is itself an actual incipient effort to concentrate. Therefore the line is hard to draw and error may creep in.

*Observer E.*—In reply to the question, 'What happens during concentration on the sound?', a typical report from E reads thus: "Strain sensations in the eye-muscles (from moving the eyes toward the buzzer and from holding the eye-lids pressed on the eyes); also bodily sensations (from a muscular set in the trunk, head and neck generally, which carried the consciousness of the task to attend strongly to the sound); also sensations from changed breathing, which probably come from the body being held somewhat more tense."

From many such reports we abstract the following factors concerned in E's concentration:

(1) Strain sensations about the eyes, and also sometimes in the

forehead and cheeks (from incipient turning of the eyes toward the buzzer).

(2) General, faint strain sensations in head, neck and trunk (they arise from a muscular set and are called by E the physiological accompaniments of attention to the sound).

(3) Vague visual image of the buzzer.

(4) Verbal kinaesthetic repetition of instruction, sometimes occurring as a memory image.

(5) The sound sensation is in the focus of consciousness; compared with what it was in the former series, it is more clear, its details and variations are more conspicuous, and it appears nearer at hand.

Having shown the nature of the act of strong attention to the sound, we turn next to inquire about the odor. How, according to the reports, was it affected in quality by the sound, and how was it attended, if at all, and how remembered? The reader is urged to have these questions in mind as he reads the following excerpts from typical introspections. In order to help him, we will first give a brief summary, of which the introspections may be taken as illustrations and extensions.

For B the odor may quite fail to appear during good concentration on the sound,—at most it is present without being clearly perceived; similarly for B it is not clear; but for E after some delay it arises clear and 'near the focus, though just outside.' Specific processes of attention to the odor are lacking, owing to the predominance of attention to the sound; this is true for B and G and at least in some measure for E.

The odor is referred to and remembered by an olfactory image, organic sensations, a kinaesthetic set, or visual images, that is, variously for each observer. The sound does not change the representation, except that in the case of B the processes are often much delayed.

*Observer B.*—"During the sound there are organic sensations in chest (?) and in head (?), which mean that the odor is present;—I am conscious of the odor, although not clearly conscious, for I do not know its intensity or quality. There are very strong organic sensations deep in the upper part of head, and also less strong muscular (?) sensations elsewhere (due to disturbance of respiration); both of these together mean effort not to attend to odor."

Various other reports read quite similarly, e. g: "The first odor varies greatly in clearness. I think there are at least two degrees of unclearness. The most unclear is hardly an odor sensation at all (if at all). However, there are organic sensations in the head (due to pressures) and less clear strains in back of neck and shoulders (all mean a pulling of the head away from the tube, or bracing it against force from the tube; also they carry the meaning, "The odor is present"). In this case I have no idea of the intensity of the odor until it is gone. Then appears an image of the odor with a more or less definite intensity. (Definiteness depends on clearness of image.)

"When the odor is actually recognized as such during successful concentration on the sound, it is vague and unclear, and varies in

intensity, generally becoming clearer toward the end. It has a certain intensity, though fine distinctions are not evident. ——"

Later the observer comes to doubt very strongly that any odor appears at all when there is good attention to the sound; at any rate if it is present, he has no memory of it when he reports. After making further special observations on this point he decides that during some tests the odor is vague and unclear, while in others it quite fails to appear during the sound.

At most, then, the odor is vaguely present and dimly referred to by organic sensations. In contrast therewith we recall this observer's reports in Series I, where processes of attention to the odor characteristically occurred. For example, "Organic sensations in the head and probably also in the body (meant effort to attend to the odor and to judge). Next came the olfactory sensation and, I think, a very vague, pale yellow image of the odor with the inside of the nostril as background. Then—general organic sensations arose (meaning effort to attend to the odor)—" etc.

Returning to the present series, we find that attention lapses to the odor only when the concentration on the sound is not successful. Then the odor "is clearly sensed in quality and intensity, and an 'absolute' judgment of intensity—generally in visual terms followed by verbal, but sometimes without the former—appears at once."

Another report, typical of many others, dwells on the rôle of feelings. "Sometimes organic sensations deep in the head mean that the odor is present. Occasionally the odor is sensed very vaguely and unclearly; I think I know that this is true only by a feeling of familiarity when I later recall the odor.

Ordinarily the odor comes up after the sound stops as an unfamiliar thing. There is a feeling of its unreality carried by certain organic sensations in the trunk. On the other hand, if concentration is not successful, the odor lasts over with a feeling of familiarity, but none of unreality. In this case there are feelings of exasperation, etc., organically carried."

We have room to quote only one typical report concerning the perception of the intensity of the odor. After taking the first breath and removing the head there were "organic sensations in the head and elsewhere and a vague visual image of a misty yellow field (?) with a bright spot in it (this meant 'I must get the odor,' the latter being represented by the bright spot). Next the olfactory image or sensation came in clear (representing the odor, of course). With this there was a visual image of a hazy yellow field plus organic sensations in the trunk (representing the intensity of the odor). At about this time the buzzer ceased."

This mode of representing the intensity of the odor is quite characteristic of this observer. But one important difference has been caused by the sound: the representative processes have been much delayed. When the sound is absent, they arise about at the time of inspiration, along with the odor sensation; but in the last quoted report the intensity of the odor is first represented at a comparatively late time, namely, considerably after the head has been withdrawn from the tube.

*Observer G.*—"When the auditory sensations were in the focus of attention, the odor was at a lower level." The odor, that is, appears on time, but is relatively unclear and unattended, because of the sound. "Muscular or strain sensations, instead of being around the nostril, shifted to the region of the ear," says an early report.

Little is said about the remembrance of the odor. Shortly after the odor has arisen, and while the sound is still in progress, there comes "a general organic feeling, which seems to stand for odor."

*Observer E.*—"The odor was generally clear; that is definite and clean-cut, of pleasant character and giving a feeling of certitude. This attitude can be analyzed into weak kinaesthetic sensations, not localized, accompanied by a pleasant affective coloring.—The sound has the focus of consciousness, but the odor is just outside of the center." Again, "the olfactory sensations come into consciousness, but seem never to get so near to the focus as do the auditory sensations." Later reports often agree that as the sound stops, the odor attains greater clearness; indeed, "they often become quite clear while the auditory sensations continue." This fair clearness of the odor makes it seem possible that there were specific processes of attention to the odor; but the observer did not mention them, so that they were probably not prominent; as no special question was put to him on this point, the matter remains in some doubt.

Let us pass on to another matter.—The memory of the first odor is once reported as having been carried by an olfactory after-image; but as a rule, the observer says, it is carried by 'a kind of kinaesthetic set.'

TABLE V.

| | | Observer B | | Observer G | | Observer E | |
|---|---|---|---|---|---|---|---|
| A | *a* | 5¼ | *8* | 5 | 5½ | 4½ | 4¾ |
| B | *b* | 3¾ | 7½ | ½ | *5* | 3¾ | 2¼ |
| C | *c* | 2½ | 5¼ | 1½ | *3* | ½ | ½ |
| D | *d* | 2¼ | 7¼ | 2½ | *1* | 3¾ | 2¼ |
| Sum | | 13¾ | *28* | 9½ | *14½* | 12½ | *9¾* |
| A | *a* | 3¼ | *7* | 4 | 4½ | 4¾ | 5½ |
| B | *b* | 3½ | 7¼ | ½ | 4½ | 3 | 3½ |
| C | *c* | 2 | 6¼ | ½ | *2* | 3 | *1* |
| D | *d* | 4¾ | 6¼ | ½ | 3½ | 2½ | 3¼ |
| Sum | | 14 | 26¾ | 5½ | *14½* | 13¼ | *13¼* |
| A | *a* | 4½ | 6¾ | 5 | *7* | 4 | *5* |
| B | *b* | 4½ | 6½ | 1½ | *7* | 3¼ | 2¼ |
| C | *c* | 2¾ | 5¾ | 2 | 6½ | 1½ | 3 |
| D | *d* | 3½ | 5½ | 0 | 4½ | 3¼ | *0* |
| Sum | | 15¼ | 23½ | 8½ | *25* | 12 | *10¼* |
| Total | | 43 | *78¼* | 23½ | *54* | 37¾ | 33¼ |

For explanation of the table, see text. (See also Appendix, §§ 12 and 13.)

Now let us turn to our results in Table V. Considering those for Observer B, we have in the first column the number of times out of eight that C was called fainter than S, no sound

being given.[1] In the second column, the number of times that C was called fainter when the strongly attended sound occurred with it. It is evident that the values in the first column are considerably less than those in the second. C is called fainter more often with the sound; its intensity is reduced by the sound.[2] The results for Observer G are similar; those for E are different and require special discussion.

§ 9. *Discussion.*—First let us return and consider the list of elements of concentration given for Observer B (p. 358). Of these the visual and auditory images of the sound may clearly be classified as representative processes. Here we are reminded of Helmholtz's pre-imagination, of Lewes' preperception; we are confirming the views and experiences of previous writers. On the other hand the strain sensations about the ears and the kinaesthetic sensations in neck, trunk and limbs obviously are something more than merely representative in character; they indicate effort; they are motor adjustments to the sound. Here again, we are reminded of previous opinions; of Fechner's strain sensations, and of Müller's *Spannung* and *Anstrengung*. We come upon something new, however, in the observer's act of pressing upon the table to make the buzzer sound; and what is quite similar, his conceiving that the sound was caused to start by his act of placing the nostril on the tube. These acts are motor, but nevertheless they are also representative. And it is evident that it is by virtue of this representative character that they make the sound better attended. The observer deliberately associates the experience of placing the nostril on the tube with the sound, thereby doubtless severing its connection with the odor; thereafter the experience of placing the nostril on the tube suggests the sound and not the odor. The working of all representative processes clearly is to suggest the impression they represent; the process is one of "associative co-excitation."

If we compare the present series with Series II, where the attention was passive and effortless, we find in the latter very much less of these activities of representation and effort. The observer is not voluntarily attending to the sound, and the sound is less clear in consciousness. It is evident, therefore, that we were justified in considering the elements above dis-

[1] Refer to p. 346 and to Table IV.

[2] We do not mean that the sound has each time reduced the odor just so much; rather there is every evidence that the effect is very irregular. All that our figures permit us to conclude is that in the long run a considerable number of inhibitions occurred; that is, the odors would on the whole have had greater strength but for the sound.

cussed as essential parts of strong voluntary attention. In order to give them all a name, including the efforts and strains and the images as well, we note their property of making the sound prominent, of bringing it forward in consciousness; accordingly we shall call them 'adducent processes.' Now, what we wish to emphasize is that our results show that voluntary increase of the attention partially consists of increase of such adducent processes and that it is wrong to give them a minor or negligible place in a theory of attention, as is usually done.

According to E's reports the olfactory sensation during the sound was definite and clear, and though not focal was nevertheless nearly so. This is in sharp contrast with the cases of G and B and perhaps is the key to the difference of the results.

It is certain that the sound was strongly attended by E and we may assume from our results that the odor was nevertheless not inhibited. Neither, as the reports show, was it considerably less attended than when the sound did not occur. To generalize this result would be only to say that increase of attention to one impression does not necessarily bring inattention to another. The inhibitory effect need not in all cases occur,—unless that increase of attention be very great. Where it does occur, we may suppose, it is because the adducent processes for the one impression render impossible the other or inhibited impression. We do not suppose, that is, that under conditions like ours one sensation inhibits another by a direct or immediate action upon it, but rather by way of intermediate processes, those namely, which we have called adducent. Hence the unreliability of obtaining an inhibition merely by increasing the intensity of one impression or by increasing the attention to one impression; for whether this will bring with it that decrease of adducent processes required for inhibition is variable for individuals and for the particular mental complex of the moment.

§ 10. *Summary.*—In the first series we found that the strength of the odor sensation was not generally lessened by the sound; but rather it was increased for three observers out of the four. As there were indications that the distraction was being counteracted by effort of attention to the odor, the observers were next trained to abandon all effort. They found that the desired state was one of mental relaxation, and gave many analyses of this condition. But while the sound was now given a better chance to work upon the odor and

thus no longer lead to augmentations, it nevertheless still failed to produce marked inhibition.

Upon this, the observers were drilled in concentrating upon the sound as strongly as they could. Then the odor sensation generally suffered an inhibition, for two observers out of three. Analysis showed that the increased attention to the sound, upon which the inhibition obviously depended, consisted of representative and other processes associated with the sound, and to these the name 'adducent processes' was applied. The inhibition of sensations was thus found to be intimately bound up with adducent processes.

## APPENDIX

§1. (Refer to p. 346.) The buzzer was placed in a box about 10x17x9.5 cm. in dimensions, the side next to the observer being open, and at a distance of 5 cm. from his left ear.

The olfactometer was clamped to an iron stand and adjusted to the height of the observer. It was fitted with a very large black screen, which served to shield the observer from odors as well as to conceal the operations of the experimenter.

For G we used beeswax, for E, India rubber, and for B and R, the combination of gum ammoniac and gutta percha. The last became weak after Series I and we obtained new ones from C. H. Stoelting Co., Chicago, which had a different quality of odor.

§2. (Refer to p. 347.) Concerning the time periods we note five points:—

1. We attempted to make the interval between the two odors to be compared fairly constant for each observer for every set of comparisons. (The signal to take the second breath was given a constant number of seconds after the beginning of the first inspiration.)

2. In order to equalize the periods of stimulation for the odors to be compared, the observer was given practice in making the second breath like the first. When deviations were noted we did not count the results.

3. In the process of smelling the observers at first took breaths of natural duration; but afterwards special drill was given in order to reduce the period, since we thought that we might more easily demonstrate inhibitions if we used brief sensations. (In Series I-D, shown in Table I above, this period is one-half second for all observers; in I-A, I-B, and I-C other, longer periods were used.)

4. Considerable effort was made to begin the sound at the instant when he breath commenced. (In this the experimenter was guided by the movements of muscles of the face and chest, by the sound of inrush of air into the nostril, and by learning with each observer how soon after the nostril was placed over the tube and in what position it was when he commenced to breathe.)

5. The sound always lasted at least as long as the inspiration. (After Series I-A it always lasted longer,—in I-D 1½ seconds longer for all observers.)

Various other measures were taken to secure regularity of procedure, with the avoidance of error and disturbance:—

1. Eight pairs together with the necessary repetitions were given

in succession, followed by a pause for rest. As a rule for every A, B, E, and F there was a corresponding C, D. G, and H, respectively,—terms which are explained under Table I above. This was important because we thus got all the things we needed to compare into the same hour, and could therefore fairly disregard changes in subjective and objective conditions from day to day.

2. To avoid exhaustion, no more than 24 or 32 pairs of odors (not counting repetitions) were given during a single hour.

3. A clean tube was used after every eight judgments,—not counting repetitions, however, which were very frequent. Tests showed that with our odors, this rate of change was satisfactory. (The tubes were washed in a solution of mercuric chloride, an antiseptic which is superior to listerine because it is odorless. They were dried with cotton, and then heated in the flame of an alcohol lamp. In Series I we heated all just before the hour's work, but as this led to the collection of moisture we later abandoned the practice, and thereafter a tube was not put into the flame until we were ready to use it.)

4. A quiet room was used for the work. When unusual noises occurred we generally stopped or did not count the results. (Our reason for strictness lay in our previous experience that noises may affect the judgment without the observer noting this fact as such. Unfortunately our conditions were often imperfect, for there were times during the winter when we had to work with a continuous but faint rustling sound from the radiator, or with stronger noises from the wind outside.)

5. Repetitions were made (unknown to the observer) when unusual noises occurred, and whenever there was marked irregularity or disturbance. Also when the observer reported 'doubtful.' (Repetitions were frequent, though not the rule. In extreme cases a pair had to be repeated four times or more before the observer was satisfied with his judgment. The observers were cautioned to distinguish properly between the terms 'doubtful' and 'equal.')

6. The experimenter gave the signals with no trace of suggestion in his voice. Also he took care to move the cylinder noiselessly over the tube when he changed the intensity, the observer assisting by calling attention to occasional failures.

7. To avoid suggestion, the aims and principles of the work were not mentioned to the observers, and they refrained from discussing the experiment with each other.

8. Drill was given to avoid expiration into the tube. (Failures were frequent and sometimes we had to stop work and give special practice.)

9. In order to escape unnecessary bodily activities, which might act as undesirable distractions, the observer customarily sat forward with eyelids lowered or closed, and nostril very near the tube, while he awaited the next signal.

§3. Since we quote many introspective reports in the present paper, we refer the reader to a recent article for description of technique which was, with some differences, the same as that herein employed (On Meaning and Understanding: this *Journal*, Oct. 1911. 1. *Introduction*, omitting (3) on p. 555). We may add that the observers were given special drill on the 'stimulus error,' on the distinction of different qualities of sensation in the various regions of the body, on attentional clearness, on the distinction between 'process' and 'meaning,' and in giving detailed descriptions of all the conscious

events as they took part in temporal order in the total process of preparing to smell, smelling, awaiting signals, judging, etc.

§4. (Refer to p. 351.) It is often difficult in describing the conditions of a psychological experiment to name all the factors that were effective in bringing about the attained results. Items of some importance are likely to escape notice. In this connection, we may take note of various elements present in this series in order to suggest to the observer the desired attitude: Signals were given in a quiet whisper, the experimenter tried to be deliberate and noiseless in his movements, and also by his general demeanor to impress the *Aufgabe;* the observers, on their part, undertook the difficult task with much earnestness, and continually tried to get or keep the desired condition. Before each set of eight comparisons, or oftener, the general instruction was always given, though usually abbreviated to a simple phrase such as "Your passive attitude!" The observer was advised to omit introspections in case preparation for these in any way interfered with the attainment of effortlessness.

§5. (Refer to p. 351.) Upon investigation I found that the observers generally had been judging intensities of sensations, not of stimuli (See L. J. Martin and G. E. Müller, Zur Analyse der Unterschiedsempfindlichkeit). As to the previous work (*op cit.*), I cannot say with certainty on this point. The difference between the two kinds of judgment is one of intentional reference;—one intends to judge stimuli, or on the other hand, sensations. Under our conditions the influencing factors are virtually the same for both kinds of judgment, so that there is no tangible difference in results, whichever reference is made.

§6. (Refer to p. 352.) Nevertheless, with an inconsistency that he admitted but could not resolve, he analyzed the feeling of relaxation into a complex of strain sensations.—"Was conscious of strains deep in the head, in the hands, legs, and trunk. I customarily describe myself as absolutely relaxed and comfortable while experiencing these strains. They seem to be merely those sensations that enable me to be conscious of my body at any time that I attend to it. They also form the positive element about relaxation that makes it possible to feel positively relaxed." At a later time he describes these 'relaxation strains' as "intermittent, thrilling sensations, very diffuse and vague, and generally pleasantly toned, having a general location but difficult to localize particularly, similar to sensations of nervousness, but entirely different from the 'dead weight' sensations that occur upon letting the arm fall."

§7. (Refer to p. 353.) On the fourth day of work the observer said that attention seemed less good than in the previous series. At the end she said that on the whole confidence in accuracy of judgment had been a trifle less.

§8. (Refer to p. 354.) To be considered with the foregoing are his replies to two questions.—What do you do when you attend to the odor? "(I hold the chest muscles more tense, and eliminate all movement except that required for the experiment); I often visualize the tube, stimulus, etc; also I generally have either an auditory memory image of the task or kinaesthetic sensations which mean the task and which produce a kind of set in which olfactory sensations are the things sought. This set seems somewhat to inhibit other things from coming to the focus of attention." He could not locate this set, but

said that it involved no effort. There was "slight effort in holding tense the muscles of the chest, but none in getting the auditory memory, or the visual image of the tube. This is all the effort I notice in the entire period, except that required to place the nostril over the tube, and to move the lips and tongue in giving judgment." Secondly, he was asked how he understood the term, 'effort'? "Something in addition to the automatic mechanical working:—Kinaesthetic sensations on either side of the chest carry the idea (of the end, namely, to breathe), which may be fairly clear or in the background of consciousness. Also there may be a vague auditory memory image (of the instructions) in the background."

§9. (Refer to p. 358.) We are not here trying to distinguish between perception and sensation, for the observers have not been drilled on this point. (Cf. this JOURNAL, Oct., 1911, 558).

§10. (Refer to p. 359.) We intend (7) not as a label for a particular experience, but as a rubric. Several experiences already mentioned fall under it, and we will here give two more instances. "———strains and muscular sensations in arms, hands, head and neck (mean effort to attend to the buzzer, or determination to succeed)." Again, "muscular sensations in left side of trunk and left side of head, strong tactual sensations, also sensations in the lobe of the left ear and organic sensations deep within the head,—all seem like strain toward the left; (the whole complex means attention to the buzzer)."

§11. (Refer to p. 359.) 'Attention away from' is not the same as mere absence of attention to; they differ as turning away from a thing differs from not turning to it. Here are further instances: "Organic sensations in the head (pressures) and less clear strains in the back of the neck and shoulders; (the complex of strains means pulling the head away from the tube, or bracing it against force from the tube; the strain sensations together with the organic carry the meaning, 'The odor is present')" Again, "Very strong organic sensations deep in the top of the head, as well as less strong muscular (?) sensations (due to disturbance of respiration) (mean effort not to attend to the odor)." Several times the attention is turned away from something indefinite: "A complex arose similar to that of tilting the head back (meaning attention from something)." (What was that something?) "It was indefinite." To this he adds, mentioning an emotion, "Organic sensations in the trunk, I think, meant fear of attention to." Sometimes in this connection he speaks of bewilderment.

§12. (Refer to Table V.) We need to explain how the fractions ½ and ¼ come into this table. The former is due to our counting the judgment 'same' or 'equal' as equivalent to ½ stronger, or ½ fainter. Occasionally, however, the judgment given is 'equal or fainter' or 'equal or stronger.' In Series I and II I classified such cases as doubtful and repeated the test. But in fact when the observer says 'equal or fainter' he definitely means 'not stronger,' and is not in doubt of at least so much; therefore I counted this judgment as half way between equal and fainter, that is, ¾ fainter. The matter, I admit, is debatable; but whatever stand we take is not of much importance for our present work, since such judgments were unusual and our figures are therefore little affected by this way of counting.

§13. (Refer to Table V.) After saying which odor was stronger the observers each time reported whether attention on the sound had been successful. In case of failure we repeated the test. Observer G was not asked to give such reports until the series was almost half over; but apart from this we made it a rule to obtain them. Where repetition is thus made the judgment in the second case may differ from the first. The figures in Table V represent the approved conditions, namely successful concentration on the sound, except for G as above noted. Our figures would have been virtually the same for G and E even if these repetitions had been omitted; but for B there is some difference: had we counted his first judgment in all cases regardless of whether attention on the sound had been good or bad, the figure for the 'Total Sum' of the second column would be 68 instead of 78¼. The repetition leading to improved concentration on the sound also leads to greater inhibition of the odor. Another set of figures for B, not included in the table, shows the same results.

# WHY KANT IS PASSING

By G. Stanley Hall.

For years I taught Kant, making him the focus to which all previous lines converged and from which all later ones diverged, and even devoted an whole year of seminary work to him. His historical importance will always remain very great. When the later systems declined, philosophy went back to Kant to re-form its lines. The Kant etymologists were exegetes of his very words. He was thought to have saved the world from the skepticism of Locke, Berkeley and Hume, and almost up to the present all thinkers must define their relations to him. But in the last two decades or so there has been a great change, even in his own land. A modern introspectionist, who holds that will is partly temperament, sits in his chair at Koenigsberg. The movement represented by *Logos* tones down his dogma to something very like literature. Some who have taught him with unction in the past have found him wanting and pronounced against him. Schurman just before laying down his professional duties, queried the value of it all, and James more than half thought the whole movement he represented a needless detour if not a grave mistake. Laboratory psychology owes him little but obfuscation, and not only introspection but the new logic and even epistemological lubrications, represented by men like Husserl, are finding out many most un-Kantian things. Fechner tried repeatedly, but was never able to understand Kant, and Hartmann called him *"der alte Confusions-rat,"* the arch sophister of modern, if not of all times, the exposure and refutation of whom became almost the master purpose of his life. Years ago Trendelenburg and Kuno Fischer waged a violent, not to say vituperative warfare as to what he really meant by his *Ding-an-sich,* and Fichte's system was built upon what Kant protested was a cardinal misunderstanding of his meaning. All who differ are always charged by those who agree, with ignorance of him. With the twentieth century the Kant-cult has rapidly fallen off, even in the Fatherland.

Bergson, who owes so much to him, has practically abjured, Cohen is turning to other things, Avenarius is in the midstage of apostacy, and Vaihinger (in his very unique and almost inspiring German type of pragmatism),[1] has, although he paused twenty-five years after it was written before publishing it, given us one of the freshest and most inspiriting of all departures from Kant and shown American and English pragmatism a new, if not a better way. Eucken long since began to drift from his Kantian moorings. Royce was too deeply enmeshed to do so but compensates by making delightful excursions into outlying realms. Münsterberg's Kantism is like a creed—a brief expression of basal youthful convictions in and sometimes very much out of season, injecting itself into his psychology. If the Kantian epistomology is, as it seems, the true *Heimat* of his soul, it matters less he is so much and often so far from home. Howison's Kant is uniquely infiltrated with Leibniz; while to the late W. T. Harris, Kant was never more than a minor prophet of Hegel. Garman used his Kantism in a masterly way, somewhat as Socrates did his dialectics, to convince youth of ignorance, to make them feel helpless and receptive so that they would follow the more docilely the way out that he had prepared for them. Six American realists, after various conferences, sought to formulate their creed in a way to minimize the long standing differences in the central Kantian field. Of their success each must judge for himself.[2] Russell, of England, agrees that relations are external; and this is the core of the new realism. Thus they, too, step out of the magic circle of Kantism. Even Cohen says (Logik der reinen Erkenntniss, Berlin, 1902), that, as more than thirty years ago he began the reconstruction of the Kantian system, he was astonished to find "that the understanding of its fundamental ideas had been lost, or rather had never been attained," that he believed that he must understand him better than he understood himself and that the sad issue of original philosophies since could be explained only by the fact that they had lost their orientation to Kant and "totally misunderstood his system, method and terminology." In what follows I have merely attempted to state curtly where and why it seems to me Kant is either wrong or of no further use for us, and to distinguish between what has become anachronistic and

[1] Die Philosophie des Als Ob, 1911, pp. 804.

[2] J. of Philos, Psychol, and Sci. Methods.

what has proven really germinal in his scheme of things, and in it all I am thinking not of experts, but of students.[3]

I. A fundamental trait of Kant's philosophy is the postulation at the outset of the sensory or faculty of intuition which he describes in his transcendental aesthetics. It is an outer or fore-court of the mind through which all impressions from the external world enter. Sense objects are radically different in kind from those of the understanding and must be imaginated or manipulated by an elaborate schematism before they can reach the four forms of ideas of the understanding, which is empty until they do so. The first criticism of Kant's Critique is that there is no such faculty as a sensory known to introspection, to pathology, to brain anatomy or to genetics. Neither subjective nor objective psychology today recognizes any such thing and it is a stumbling block in the way of all these disciplines, as much indeed a product of abstraction as any scholastic quiddity or phrenological faculty. The great authority in which its author's philosophy is still held makes this doctrine a formidable foreign body in psychology. Sensation, perception and understanding represent roughly the various degrees of appropriation of apperception, the whole process of which is too integral to be partitioned. The deliverances of each sense are often if not usually far more closely connected with the higher assimilative processes than they are with the data of other senses. Auditory, tactile and olfactory impressions may be understood each with no reference to the other. Even the old doctrine of common sensibles applies to but a few classes of sensations such as sight and touch or to abnormal fusions like cases of colored hearing, photisms and the rest. The senses are for the most part disparate and incommensurable, so that Kant's sensory is a product of the exigencies of his age and has nothing to correspond with it in the soul.

II. The geneticist however can never rest in refutation, but must always find a cause for every aberration from the truth. So here he must ask why the famous Königsberg postulator came to hypothecate such a thing as a sensory. The answer is because, like all epistemologists and idealists, he misprized time, space and matter as he also did sensation. Between Locke who accepted the senses as the only source of true knowledge on the one hand and on the other Berkeley's impeachment of their witness, Kant, like the true arbitrator he always strove to be, gave them the humble yet important

[3] See also my paper on Berkeley, A Genetic View of Berkeley's Religious Motivation. J. of Religious Psychology, April, 1912, p. 137-162.

function of purveyors. They can tell us nothing of the ipsissimal *Ding an sich,* but they are otherwise veracious. This is the only compromise position possible. The senses are feeders to the understanding and their certainty is sufficient and with that we must be pragmatically satisfied. All they say is true and the mind, a vacant *tabula rasa* before, now reveals previous, undiscernible potentialities. Yet back of all these processes there remains something noumenal, unknown and unknowable, the metaphysical soul of things that the senses cannot grasp or convey. Thus both Berkeleyans and Lockeans, both idealists and materialists, must make concessions and each must admit the partial truth of the other. This was indeed a masterly form of constructive diplomatic accommodation. As a treaty of peace between warring partisans, it showed consummate skill in the construction of its terms, but in drawing it up, current doctrines and not the actual facts of sense experience were considered. It was all dogma and there was no true psychological science about it. Moreover, it was all, artful and covert as it was, in the interests of idealism as was shown by Fichte, Kant's *enfant terrible,* who, by identifying the *Ding an sich* and the self, drew the inevitable logical consequence of absolute idealism. Kant, though no doubt secretly pleased, officially drew back from Fichte as dangerous to his scheme of harmony.

The pact between parties which created this monstrous thing called the sensory had also divorced what nature had made one and inseparable, viz., sense and intellect, and so widely that between them yawned a chasm which in the interest of a decent and common loyalty to the facts of mind had to be bridged. To do this, Kant constructed one of the most fantastical of all speculative creations, his *schemata,* made solely of time aspects, ignoring those of space, viz., the quantitative *series,* the qualitative *content,* the relational *order* and the modal *whole* of time. Through these, the *a priori* concepts of the understanding get their grist to grind. But no experimental or introspective study of the processes of perceiving and comprehending things ever found the filmiest trace of any part of these schemata. They are the pure inventions of this conciliator and concordat maker, now however seeking not to harmonize opposing parties, but to heal a scission or fission which the exigencies of his own previous arguments had caused him to make in the soul itself. Before he had sacrificed psychic facts to harmony. He was now patching together the edges of the gaping wound he himself had inflicted, for the normal soul shows no trace of

any surface of cleavage between sense and intellect, but only perfect continuity.

III. Again, neither time nor space is the proprium of the senses alone, of which only he makes them the categories. He drops space unceremoniously, and strangely and curiously enough takes time to the very gates of the understanding which however it too cannot pass, for according to him both belong to a lower order of psychic truth than do quality, quantity, relation and modality, although from Aristotle down to modern philosophy no one had ever before challenged the place of both these at the regal table of categories. In point of fact, the reign of time and space only begins in the sphere of sense and they constitute almost the master light of all our thinking, however logical and abstract it be. Moreover, it is space and not time that is paramount. The highest, clearest and surest thinking, even imageless thought itself, if such there be, can no more transcend time and space than the bird can outfly the air. Both are implicit in every psychic act. If we once break with these trusty guides, we are at the mercy of any fatuous speculator, for we are in the condition of one who cannot swim and is beyond his depth and clutches at any straw. To give them the supreme place in the lower realm of sense does not atone for banishing them from the lofty realm of innate ideas where they had always been—a realm where they do not but should reign, as Trendelenburg long ago showed, without motion or change or any other dynamic idea, *werden* or development. It is like transition from the warm, moist, vital, growing earth to the cold, arid, dead moon and moreover, no airship of speculation can ever really make such a trip. The true doctrine of the sensory relations that accords with modern psychology and neurology, brushes aside all this Kantian work of sejunction. There need be no gash, therefore no sewing up with clumsy stitches. Sensory processes in fact pervade the entire domain of the understanding. The recent studies of sense have helped us far more to understand understanding than have studies of the understanding helped to understand sense. Modern psychology has tended to give to sense the hegemony over understanding rather than conversely, à la Kant. Aschenbrödel has found in introspection her fairy prince. He has transformed her from drudge to queen, but she comes to her own kingdom with no malice toward even the cruel stepmother who so long degraded her.

IV. But the mesh of Schemata that make it so hard to pass from one to the other, or at least to understand how

impressions get into the mind themselves and are subsumed under the categories, is less intricate than if we take our stand within the mind and proceed downward toward the senses, for this way the maze is still harder to thrid. To apply synthetic judgments *a priori* to sense data, we must use *axioms of intuition* if they are extensive, and *anticipations of perception,* if they have degrees of intensity. That is, we must consider the permanent possibilities of sensation. There must be, third, *analogies of experience* so far as accidents, cause and effect, or reciprocity in time relations are concerned; and fourth, there must be *postulates of empirical thinking,* viz., possibility, actuality and necessity. These and only these judgments we can make, but we must always apply them to objects of possible experience and never to noumenal things beyond that we cannot experience, for the intellect cannot transcend sense because the idealist makes all knowledge only phenomenal.

Categories are the *summa genera* of thought. As the term implies, they were said to have been derived by Aristotle from listening to all topics of conversation in the marketplace, and to be thus products of induction, the highest generalizations from experience. If we took all the themes from encyclopedias, dictionaries, biographies, written and unwritten, etc., etc., and classified them into varieties, species, genera, orders, we should reach a few supreme intellectual radicals like, e.g., the 121 speech roots which Max Müller thought to be the ultimate sources of all words in Aryan languages. In point of fact, however, categories are not thus inferred, but they are assumed postulates and their validity depends upon their applicability. They are not conclusions of induction, but the most advantageous starting points of deduction. As Trendelenburg's classic treatment of their history shows, they are the prime determinants in all systems. Given his categories, you can infer most of a philosopher's scheme of things. They are supposed to shine by their own light like the sun and not by reflected light like the moon. They are the source of all our philosophic seeing. Save for the above dim peripatetic tradition, they have always been taken for granted, given not made, and Kant planks them down with no thought or query as to their pedigree or derivation, a duodecalogue, his twelve Tables of the Law for his *Verstand.* He never dreamed that though innate in the individual, they might be acquired by the race as Herbert Spencer said, nor that they hang together in one organic whole, a diamond network, as Hegel's logic sought to show. They stand forth in the Kantian scheme as

not only underived, but isolated from each other in the region that Locke thought void, and despite Occam's razor, or law of parsimony which taught that ultimates or essences should not be admitted save under the stress of dire necessity. The whole dozen of them (a sacred number by the way) make their début veiled and sunk in mystic slumber till awakened from their spell by the incantation of sense experience and then they assert themselves as lords of life and knowledge and at the same time as our interpreters and guides, and yet they are solely logical, noetic, static, without a dynamic principle among them all. Because they are above time and space, they are also above all such concepts as energy, activity, *actus et purus*, while evolution, change and movement have no place among them.

But in fact categories are abstractions and not entities, essences or enneads. They do not preexist in the mind as innate ideas. Their *esse* is *cogitari* as Berkeley said the *esse* of things is *percipi*. They have no existence in the nature of mind but even the best and truest of them are only permanent possibilities of thought. They are not only not metaphysical but not even metapsychological. They are not archetypes, but ectypes. They are psychological phenomena, not noumena. They say nothing and do nothing. They are only highly generalized names for groups of concrete experiences. They are the purely imaginary fetiches of the ideolatrists. They are composite photographs of actual thought processes bundled up into classes. They are not even analogues of the generalized type forms of biology, like the patrofelis, father of all the cat tribe, with the general traits of all and the special traits of none of the species that spring from it. Each is only the *flatus vocis* designating the point where concrete empirical thinking in a given domain vanishes into the inane and conversely, the point of departure for a deductive logic that wants a major premise all connotation with no denotation. They are the ghosts of defunct things and thoughts reincarnated by clothing them with sarcous and experiential habiliments. They are little more than the logician's wishes embodied in definitions and that is why they are little less than sacrosanct to their creators. They are the scholastic entities accommodated to post-Lockean fashions just enough to enable them to pass the now relaxed *censur* of Locke's followers. In point of fact, they are probably not entirely imageless to introspection but they always tend to be hypostatized and made the most instead of, as they are, the least real of all the creations of human thought.

Again, about all the distinctions implied in the whole Kantian web of them are really made in extremely elementary sense experience. One and many, assent and dissent, reality and appearance, certainty and possibility;—all these are involved in a rhizopod's quest for food. An object is there or not there. It is big or little, truly or apparently there, and it must or may be there; however low in the scale these distinctions of quality, quantity, relation (and mode) respectively, they are not only implicit in elemental activities but perhaps as effective there as in the human domain. Thus, if time, space and objective reality, which Kant would relegate to the sensory, do in fact reach up through all the processes of understanding, so conversely his categories reach down to the sensory of even a rhizopod, to which therefore, we must give his *Verstand*. Very low forms distinguish one or two or more eggs or young, decide between acts or things as if by a rudimentary yes or no, are wary of the appearance of enemies and wise in detecting true and false signs of them and distinguish between the possible and the impossible, as all observations on the simpler forms of instinct and all controlled conditions for the study of trial and error processes abundantly show. These processes animals are performing all the time and perhaps they are no less prerogatives of the brute than of the human intellect. Thus, if a Kant of the animal mind were to arise and give it the honor of a critique, he would have to give it a table of categories, and the clumsy structure of Kant as it stands would perhaps fit them as well as it does man.

Thus limiting ourselves to Kant's very inadequate and antiquated table of categories, three out of four of his groups so factitiously trinalized, viz., those that deal with one and many, affirmation and negation, substance, attribute and cause, if not reciprocity, are objective distinctions which inhere primarily in nature, and only so far as these are apprehended, that is, only in a secondary and derived way, do they inhere in mind. To subjectivize them denatures them. They are independent of all and every intelligence, else science rings hollow and falsetto, for in it we are in fact studying real objects and not studying the mind. The mind is only a medium which has its defects as does the eye, but the interpretations of neither invalidate their objects. Things are things, as sound common sense and the *consensus omnium gentium* considers them and to assume that they are essentially other than we know them hamstrings intelligence. The *Ding an sich* is not even an unknown, but a meaningless

abracadabra, a name for nothing either psychic or physical, a superstition of logic, a creaking of the thought machinery which vanishes when the psychic processes are oiled so as to work smoothly as they should do.

The *judgment* of formal logic, which deals with proposition and syllogism, gave Kant his categories. This was natural in a day when logic was the queen reigning supreme over the whole domain of knowledge, the discipline of disciplines, a complete grammar of thought; when psychology was only a menial handmaiden in the house of philosophy and science was rudimentary and dealt chiefly with non-living matter. His categorolatry is for us a pregnant reminder of the long past day of this enthronement of logic. He sought only to give it the same authority in philosophy that mathematics had for physics and astronomy (which then stood chiefly for science). It has always, from Plato to Spinoza, been the pet foible of speculators to postulate such an organon of sun-clear, primal, *a priori,* necessary truths, from which one could reason *de more geometrico.* But the very fact that no two deductors agree in axioms, methods or conclusions, ought to dispose of this inveterate fallacy. Mathematical categories have universal but speculative categories have attained only the minimum of consensus. Indeed, the muse of the kind of logic that inspired Kant's categories is now only a formal cult, her votaries are few and when and where her voice is at all heard it is in the thin and piping notes of age. His categories thus have no more real authority over the thought of our age than the canons of theoretical aesthetics have in the world of art or the old creeds and theological systems over the religious and moral life of our age. All these linger on in the protected and artificial conditions of academic life but only there. Categories are foreign bodies, interfering with real cultural efficiency. Instead of being organs of apperception or modes of assimilating sense perception they are strange, nondescript, mongrel products, half platitudes and common places, half artifacts and surds. They cling like burrs well rubbed into the hair and beard in the minds of those indoctrinated but must be combed out, painful though the process be, if we make a good and modern intellectual toilet.

To know things through the media of time and space is, according to Kant, not to know them really and truly but to know them phenomenally and mathematics lives entirely in the realm of the transcendental aesthetics, i.e., in the sensory, for it deals only with time and space relations. In fact all

real things are in time and space but to Kant they are so *for us* and not for and in themselves, so that mathematics concerns itself only with their phenomena. Thus he twice degrades mathematics, once by relegating it to the sensory and again by limiting it to mere appearance. Never was mathematics put so low in a hierarchy of knowledges. But what are the judgments of quantity at least, to say nothing of those of quality, but mathematical, and of the elementary, arithmetical kind, and yet he puts them in the understanding. The later logic of Boole applied mathematics to the domain of quality, relation and mode in defiance of Kant. Affirmation and negation, limit, cause, reciprocity, infinity and possibility—all these now have their calculus and are measurable by this science which Kant makes a subaltern of the sensory. Moreover mathematics now proves that even axioms are not of *a priori* but of empirical origin. Thus, his carefully surveyed boundary between sense and intelligence is not only broken through at every point but is practically obliterated by modern psychology.

The simile of "spelling percepts to read them as experiences" has done perhaps even more than all Kant's arguments to give a certain verisimilitude to his bifurcated theory of noetic origins and processes. It shows Kant a persuasive rhetorician. But a glance shows the fallacy of the conception. Sense data are not late understood symbols but as we have seen, the oldest and truest sources of all that is psychic in the world. To make his simile true instead of like letters he might better have assumed percepts to be like primitive root words or sounds. Again, the child speaks and understands before it reads. True and living speech lies in the aboriginal ear-mouth tract, while reading long-circuits speech to the optical tract and substitutes the dead, artificial, printed page for social converse. In understanding its environment a child does not pick out analyzed sense data, as letters are analyzed phonic elements, and combine them by synthetic judgments *a priori*. By every natural method of teaching reading today he is taught to see the whole word-picture first, and is told its meaning by some one, for he never would have guessed it for himself. The implication that sense data are arbitrary signs like letters and that the epistemologist is the primary teacher of how to learn to read meaning into them is very dear to idealogues, almost as much so as the conception of Socrates that the philosopher is a midwife of ideas. In fact however several German states forbid spelling methods by law and most pedagogues condemn them as mind-

breaking and cruel, and the Kantian scheme is no less antinatural and false to psychic facts and processes. This illustration therefore can have value only if we make the following preposterous assumption, viz., that the child can and does know language only by means of reading and not before, that it gets all its knowledge from the printed page and that letters themselves represent the elements and give the data of all cognition, somewhat like the chemical elements into which everything can be analyzed. In the letters to be spelled, if this simile of Kant's holds true, all possible knowledge must lie implicit, as the Talmudists thought.

Turning now to the Transcendental Dialectics, which deals with reason, which is factitiously partitioned off from the understanding by containing ideas instead of categories, which forms principles from the ideas instead of makes maxims from concepts, we find reason conceived as the faculty of the unconditioned although it depends upon the judgments of the understanding, somewhat as the understanding depends upon the sensory. Yet although transcendental in its nature and origin, reason must never become transcendent, that is, it must not apply the categories beyond experience or to the unconditioned, because to think is to condition, as Hamilton in his most Kantian chapter later argued. The first false magic lantern picture which reason has always loved to project is that there is a soul or thinking subject. The so-called rational psychology of Kant's day knew much about the soul and made it unitary, simple, undecomposable, outside of space if not out of time, immortal. All we can really get out of the Cartesian *cogito ergo sum* is that thinking is a real phenomenon. But from this to infer to an ego or object to which categories can be applied is a paralogism or subreption and may lead to the delusion of conceiving the soul-self as either matter or spirit according to diathesis or preconception. Why if categories are transexperiential or transcendental in their origin, may they not, for aught we know, be also applied transcendentally or beyond experience? Speculators had, indeed, almost universally assumed that these mystic, authoritative categories, strangers of alien origin, may tell us of things beyond the ken of experience, thus correlating their origin and range of application. Psychoanalysis also suggests that they have been so cherished chiefly because they have some oracular and revelatory power of this kind. If, for example, they originated in race-experience, why not apply them as keys to it? Kant, however, denied the transcendental application and should he not also have

denied transcendental origin? Had he acknowledged that they were empirical, as in fact they are, at least phyletically in their origin, he would have had a better warrant to confine them to experience. Why a transcendental origin and no transcendent field? This seems an anomaly in the critical philosophy. The answer is that Kant was even more pragmatist than he knew and even here wiser in practical application than, in his pre-evolutionary days, he could perhaps be expected to be in explaining origins. He saw aright when it came to the uses of categories but followed the easy, traditional way of assuming them underived, as Moses brought down the Tables of the Law. Postulation and hypothecation for him play a rôle not unlike that of myth for Plato. Both were tentative formulae or frescoes on the wall of nescience where knowledge stopped. They were to be accepted by faith, at least pending the advent of knowledge. With his strong evolutionistic tendencies it is almost certain that, had he lived in our day, he would never have insisted upon the transcendentality of the categories, for idealist though he was by temperament and sympathy, he would have shrunk back in anticipation of the transcending use of the categories that became the chief feature of the system of his successors, Fichte and Hegel, who were encouraged to use them thus by his ascribing to them a transcendental origin. To have shown that pure reason can never prove the existence of the soul as a substantial entity, that reason can never reach the *Ding an sich* but can only study its phenomena, quaint as the logical method was by which he arrived at this result, was a master-stroke. But it is almost like Canute sweeping back the tide to evict the bias of hopes and fears regarding a future life that since Kant, almost as much as before him, has both shaped and motivated so much of so-called scientific psychology. The lust to know whether if a man die he shall live again, which Myers says is the supreme problem of all the ages, still weights all the dice and makes us lynx-eyed for every favorable and bat-eyed to every contradictory intimation. It was reserved for the invalid, under-vitalized and academically isolated Kant, who almost immolated himself to his theme and who knew the world he lived in so extensively but only through the dim, second-hand and bloodless medium of books, to waive his own personality enough to make the great renunciation of evicting at least from his cold weird logical reason this all-pervading lust so to construe the soul that it should be made of something which should be at least immortal enough not to be blown away or dissolved

into the elements when "the tides that draw us from the boundless deep turn again home." A less anaemic or frigid nature would hardly muster the virtue to see or the courage to proclaim a soulless psychology. Arguments in general, especially such weird, old logical gearing as his, only give pretexts for believing what one will. We have additional and better ones now for the same agnosticism concerning the soul's entity or substrate and must bravely accept the phenomenality of our psychology in the sense that botany and zoology accept their science without a biologos or spirit of life, that physiology dispenses with its old vital principle, and physics accepts matter without being able to define it or energy.

As to the cosmological idea, pure reason can make, we are told, no statements regarding the universe as a whole because for every thesis there is an antithesis that can be no less cogently proven and hence arise the antinomies. Quantitatively we may say the world began in time and has limits in space or conversely that it was eternal and is infinite in extent. Qualitatively we may affirm or deny that everything is compounded of ultimate, simple parts, or that we can never get to absolute simplicity and atoms and even ions may themselves be indefinitely compounded, i.e., matter may be infinitely divisible or there may be a perfect continuum back of all as C. M. Pierce says. Relationally this may be called a world of law and necessity, where causation reigns supreme, or we may postulate freedom which may be itself a true cause. Modally we may urge that all came from something or some being that is absolutely necessary, or again that there is no fate and all is contingent. These four dialectic contradictions Kant uses to show how agnostic man is doomed to be concerning the great autos, Nature, whose Memnonian lips will never open to give answer to any of these questions, however agonizingly and desperately we may shout them into the great inane. We can never penetrate the veil or reach the soul of Nature or even know whether she has any, nor find out what she means by all her phenomena or processes. Science may peer and query but can only answer her own questions by others more subtle. However vast the area of knowledge grows, it is itself still surrounded on all sides by a limiting surface of ignorance which can never be passed. A true philosophy and still more a true metaphysics of nature is thus forever impossible. How epistemologists since have loved to shake this old Gorgon's head in the face of science and tell her what she can do and know and what not with-

out committing the unpardonable sin of "transcending!" On the other hand, how enormously our ideas of the extent of the universe have grown, how it has swelled in time and space to dimensions big enough to be practically infinity, although there is always a beyond for every new frontier, no matter how far it is advanced! Hence, who cares for the difference between astronomical and mathematical space or time, or indeed for anything meta-mathematical or meta-astronomical? We need never feel claustrophobic or shut-in symptoms. So as to divisibility, the thousand ions in an atom of hydrogen are small enough. What difference can it make save for the mania of a paranoiac logic-chopper whether there are indefinitely smaller bodies?

As to the antithesis between causation and freedom, where Kant would non-suit or outlaw both contestants, we are taken into the very different domain of the relation between the cosmos and the human or moral order of things. Here we must continue to investigate and discuss despite Kant's *caveat*. Both contestants have their rights and the practicalities involved are many and great. He might with precisely the same justification taboo the problem of objectivity *versus* subjectivity for the one is just as insistent and yet as insoluble as the other. In fact, Kant himself later in the "Practical Reason" takes his stand unreservedly upon the side of freedom as against law, in violation of his own prescription, and here again he is pragmatic. Partisans who desire to assert either to the entire exclusion of the other are now few if any. Both can be vindicated and each has an ever widening domain and ever stronger case. The whip-row here is not within the cosmological realm but it is between that and the moral order or between Kant's pure and practical reason. These are as incommensurate at least as color and form, if not as vibrations felt by the hand and those felt by the fibres of Corti's arches in the cochlea. The third antinomy is thus a commonplace with no agnostic implication whatever save to those who would cast themselves into the camp of the ultra-materialists or spiritualists. These thinkers constitute a now happily extinct genus. A fresh bumper, then, to the great little apostle of pure reason, the peruked precisian and fence-viewer! Or, more temperately, a fresh sprig of bay on his tomb in bleak, far-off Königsberg, for his help in hastening their extermination, for they are unfit to survive under the conditions of either present-day science or philosophy!

As to the fourth antinomy, whether the world has a necessary first cause or had to be at all, or is a product of chance,

either view can be maintained. Only theologians know or care whether God had to create the world or did it out of caprice, good will or malevolence. From Spinoza who said substance might have had an indefinite number of other attributes than the two it had, viz., thought and extension; and from Malebranche, who revived the old creed that creation is constant preservation, that God is creating the universe every instant and that he intervenes on every occasion when mind and body co-act, to von Hartmann who said the worlds and stars are pimples in a rash with which the divine Absolute Being broke out, and serve to mitigate his transcendent pain or negative eudaemonism, and to those fatalists and materialists who say that from the nebulae to man all the great processional everywhere had to be just as it is and there is at no point any possibility of miracle or of accident: —in the whole genus of ratiocinations of which these are specimens, we never can make the slightest addition to actual knowledge. If Kant only meant to rank all such speculative dreams as the poetry and romance of philosophizing, he did a service. He was in fact an evolutionist so far as the origin of the worlds from nebulae is concerned and doubtless believed in the reign of law over all these processes and if so, all the greater was the virtue of his proclamation of neutrality here and his call to the factionists to lay down arms, or be sentenced to *Banausia*.

Lastly, as to God. It was easy to puncture the old Anselmic ontological argument from the conception of an absolute or perfect being to his predication, for we cannot infer from idea to the existence of the object of that idea. *Is* is only a copula and does not assert existence. Conception only involves possibility and not actual reality. If every man who ever lived believed in a God, that would be no proof that he existed, nor if all wanted and felt the need of one, would it argue existence any more than the conception of a fortune or the wish therefor would bring it. We cannot argue from notions to the existence of their objects, for culture history shows that most things that have been universally believed are now known to be non-existent. Again, from the existence of the world or of my own and all other selves, we cannot argue that there is or must have been a most real and necessary cause as real or more so than its effects. We have seen that all might arise from chance and if we require a cause, that would not necessarily involve a God, but force and matter might suffice. Third, the teleological argument for God, or the proof from design or with physico- or natural

teleology, venerable as it is, can at its very best only give us a manipulator of material already created. This contented Kant. But we could now add that the old concept of design which has always been the most bitter and inveterate foe of evolution throughout all history, is now hopelessly and forever shattered by it.

Thus, in fine, reason can never prove the existence of God, still less his function as creator or planner of the world. The idea of such a being is not constitutive but merely regulative and formal. The God-idea may be and perhaps is in itself the summit and crown of human thought, its greatest achievement in fact, but the existence of any objective being corresponding to this idea can never be either proven or disproven. All the certainty there seems to be or is concerning the existence of God or soul or a cosmic order, i.e., whether this is a uni- or a multi-verse, as in Hafid's dream, is solely subjective and we must get on with that and find it sufficient.

With this, Kant's first critique ends. If the field so far surveyed had represented the whole of the soul of man or if Kant had died at this point, he would have been known as the most extreme of all agnostics. Time, space and mathematics are for the first time degraded to the sphere of sense and thus made not only subjective forms, but subalterns. We can never attain true knowledge of anything in their domain and yet this domain we never can transcend. What we have called matter is made up of various congeries of phenomena and appearances and there is nothing more tangible than the ghostly *Ding an sich* back of it all, so that the world is essentially hollow and unreal. Intelligence can only work upon sense data and concerning the nature or existence of soul, natural science or God, we can never know. Never was there such a thorough housecleaning of man's soul. Never were substance and everything metaphysical so cheapened and almost vanquished together with their time and space receptacle. The latter even Berkeley, who subjectified matter, clung to, but psychology as then understood, cosmology and theology (which Berkeley particularly held a brief for) were themselves by Kant cast into the void of phenomenalism he had created. "The rich old world lay shattered and ruined at Kant's feet" (Vaihinger) and pessimism seemed the imminent if not inevitable sequel, for Kant had out-Berkeleyed Berkeley, while in his negative treatment of cause and the ego, he had out-Humed Hume. He accepted all that Locke had said, viz., that the senses are the source of all mental content but cheapened their data, outraged him by equipping

the mind very richly with innate ideas to such numbers and in such a way that the subject is all and the object nothing.[4] Prodigious as were the powers he gave to the soul in the categories, he shut it away from everything whatever except empirical data themselves essentially unreal. Hence it was no wonder but rather inevitable that his great successors, especially Schelling, Fichte and Hegel broke the walls and let the giant of their Romantic Philosophy loose upon the forbidden grail quest for the transcendental. This is the point in Kant's system where, during his own life and since, earnest truth-loving students have committed suicide because Kant seemed to have robbed them of all that was worth living for—Truth, the Soul, God and Heaven.

Until we reach the transcendent dialectics treating soul, world and God, the Kantian Critique has now little value or interest to students of mind, save a historical one. Yet strange to say, it is just this part that has had chief attention for more than a century since its appearance (1787), while his Critique of the Practical Reason in which his merit culminated was only superficially discussed or apprehended till in our day the Pragmatists have dug up its meaning, fragment by fragment with, however, very scant acknowledgments to the author because they lacked historical sense or knowledge enough of it and its implications to realize that everything they have said or more lies patent or latent in it. In modern Pragmatism, the true Kant has been resurrected; indeed has been for the first time really discerned. It is not creditable to the state of the history of philosophy or to the true knowledge of Kant by English or even German writers and readers of Pragmatism that they stare blankly and even show incredulity when told that it was all in Kant and more and that they have really only begun to exhume his remains, unwinding his cerements or combing out his coiffure as the peignoired Brobdignagians did those of the great Gulliver. At least, to change the trope, they are only shoveling out

[4] Heine satirized the situation somewhat as follows: The day Kant finished his lectures on the Critique of Pure Reason, his old servant, Lampe, came for him, and as the weather was very bad as usual in far off semi-boreal regions, put on his overcoat, muffler and galoshes, and took him carefully home, holding an umbrella over him, etc. As they went, Kant reflected to himself: "I have executed God, as the French did their Louis, and the English their Charles I, but it is really too bad to rob such a poor creature as Lampe of his God. Even a dog needs a master to look up to as his God." So the great, little philosopher went home and wrote his Critique of the Practical Reason for the poor in spirit.

the soil he loosened. Beyond all comparison the greatest and truest thing Kant told the world was that the will is larger and deeper than the intellect. With him it first began to come to its rights, as the feelings did with Jacobi and Schleiermacher, all of which modern psychology confirms and reaffirms. Kant thus set up a new and higher criterion of truth far above that of the old logic. A new king was proclaimed in philosopherdom whose dominion is to extend even over the whole Philistia of intellect as well. Ethics was seated on the old throne of ratiocination. Conduct is above even noetics. The Kantian epistemology had been so belabored, commented on and its very verbiage so tortured like Sacred Writ by exegetes, although the Critique was written down hastily in a few months with chief attention to its content rather than to its form, that only today have we really begun to read and understand this second and greater Critique in a way that will show, when we see it all in its true perspective, that our Pragmatism is so far only a faint revival of Kant, for all the insolvencies of pure reason were cashed in with interest by the new firm of Conscience and Co. Doing is now the true organ of knowing. Do your duty and you shall know the true truth, was his proclamation. Wisdom is justified by acts and deeds and not by categories, still less by dogma.

The procedure of this new instauration is clear and simple. We must first turn right about face, or invert ourselves as Dante had to do at the lowest hell, at the earth's center of gravity, to be shot out at the other side of it at the foot of the purgatorial mountain. The problem is now no longer how can the pure reason know objects *a priori,* but how can the practical reason determine will *a priori.* We care no more for the cognizability of objects, but only to direct volition or creation aright. We start from moral principles, not from sense intuitions.

The philosophy of conduct thus begins with the freedom of the will, the very existence of which *pure* reason could not prove without meeting the reverse or opposite argument of the antinomy. We have an immediate and ineluctable sense that we could have done otherwise, could do or even think this or that, and these amphibolies are always present. This is the first regulative principle, the constitutive value of which is here subordinate or rather entirely irrelevant. Freedom is the prime fact of man's moral experience. It is immanent in our selves, positive and not transcendent. Here a critique must show its relations to the sensory through the impulses

and inclinations in which it works for these are the sense motives of the empiric instead of the pure will. Now, this empirical will is transcendent and the intelligible is immanent, reversing these relations as they stood in the first critique. The law-giving will must determine itself in, for and by itself, purely and autonomously. Here then we have a new category, the imperative "Thou oughtest." This gives the supreme momentum and sanction of conduct. The lowest momentum from the empirical will is of a different nature, is heteronomous or imposed from without as an alien foreign determinant made up of the desire of pleasure and dread of pain. The former law of oughtness in freedom is universal, constant and necessary, but the algedonic or natural motives are fluctuating and moreover they can never be formulated as binding upon all men in all times and under all conditions. They can only be codified and utilized as maxims. They alone have given content to the will as the sensory does to the understanding. Hence, we must first put them in their most generalized form. When we do so, we attain the precept, "Act so that the principles that determine your act might be universal," so that for all with this rule of conduct there would be no contradiction and least harm and greatest good would be done to the greatest number. Thus utilitarianism is everywhere present, but everywhere subordinate to the higher autonomous oughtness. Hedonism and meliorism are in the inner court of the temple, but not in the sacred adytum itself where the oracle speaks.

What is the impulsion to act purely from within regardless of pleasure and pain? To this question Kant answers, we think wrongly, by introducing a noetic element. We know and revere immediately the moral law which reveals itself within. The awe thus inspired which strikes down self conceit and on the instant subordinates us to its behest is not a sensuous feeling, nor is it pathological or tainted by fear or hope, but it is an "intellectual feeling" of a unique kind, something *sui generis* and unlike everything else in the soul. We feel towards the moral law within the same devoutness that we feel toward the starry heavens without (the legend on his tombstone). The pain of subordination and coercion is exactly balanced by the pleasure of exaltation and expansion. Reverence is thus out of and above the domain of inclination or even love or, on the other hand, disgust or aversion. This rigorism does not imply that a duty can be done only against resistance or against natural inclination.

Here are implications that modern psychology, which in-

cludes ethics, cannot follow, even with the best will to do so. First, instead of a categorical imperative which incites to duty in general, with no intimation of any specific duty, psychology places the simple nisus or push up of evolution which says "Excelsior," and impels all to make the most and best of themselves. This is no less venerable or cogent, for it has behind it all the momenta of the whole evolutionary process. It is the *vis a tergo* that impels man ever onward and upward. It is the center of the current of the whole stream of tendencies that has made man man, that flows in the world today and strives to bring in the kingdom of the superman. It dominates and determines all our acts, but especially those we call moral.

Secondly, it is not the Stoic or Puritan conscience alone with its stern demands, with its pleasure-fearing, pain-despising implications and attributes, but it is the Greek chivalric honor as well which impels always to the highest ideal in conduct with loyalty to the race and to the unborn. Though of pagan origin, honor is more genial and humanistic, but it and duty always need each other to impel to the highest good.

Third, the supreme inner oracle of righteousness not only impels but it deters, like Socrates' daimon or the ten commandments. It has a negative which is quite as great as its positive or affirmatory function. A sense of worthiness and unworth, of merit and demerit always go together. The eternal nay is not in the vocabulary of Kant's categorical imperative, although the instinct what not to do is one of the most precious acquisitions in the whole struggle for survival. Do nothing unbecoming the *Übermensch* burgeoning in all of us, nothing against life, health, or virtue. That is, the ideal of the best men and women we might be takes the place of the men and women we are. This is the slogan of the modern evolutionary categorical imperative. This, too, may defy all inclination and demand even the immolation of the self in the interests of the race. Supreme self-sacrifice may be imperative. But even in such extremity, if we are hated, beggared, despised, tortured, we shall have the sublime satisfaction of the *mens conscia sibi recti.* A little of this pleasure once only in a lifetime may outweigh lower and life-long pleasure, as John Stuart Mill said, who would follow his inmost conviction of what was right and good "and if God wishes to send me to hell for this, to hell will I gladly go" and be happy there although he defied the Almighty, like Prometheus chained to the rock for his fire-bringing service to man. Of such metal the highest heroism is made. But

even such supreme self-sacrifice is not without consolation. Hence Kant is wrong. Man may rise far above the always selfish hope of heaven and dread of hell, but the fulfilment of his destiny always brings inner approval and he can almost hear this monitor say, "Well done." Hence Kant's attempt to rise to superalgedonic regions was a Pegasus flight which is impossible in the world of moral experience and which even the theories of intuitive morals do not need. All that is necessary is to distinguish the motivation of the race from that of the self, phyletic from ontogenetic ethics, for Kant's categorical imperative must and can only today be interpreted as the still, small voice of the race whispering amid all the louder voices of the ego. It says, "Thou oughtest" but to this adds thou oughtest first, last and always, to serve the race, whatever betides thee. Now this brings a unique but entirely supersensuous and superegoistic happiness that is ecstatic and intoxicating. It is the voice in the soul of the power that makes for righteousness.

But next and fortunately, the interests of the individual and the race usually coincide and rarely require the immolation of the former. Most of the deeper and stronger impulses are race-revering and most that really develops the individual and widens his pleasure field helps humanity. Antinomy and heteronomy are by no means always or indeed very often in conflict and so do not need Kant's belabored analytic to connect them. Indeed their harmony amounts almost to identity. We think we act for ourselves when we really are acting for the race. The only misfit modern psychology finds here is that between the also usually coinciding yet sometimes opposed individuation and genesis of Herbert Spencer. Taking our stand upon this instead of the Kantian principle, "Act so that thy maxims will be sound if universally acted on," we now say, "Develop your individuality to the highest point compatible with the most effective increase and transmission of life; be and do all you can to attain the optimum of parenthood." All less than this is defect and all beyond is excess, and on both the gods of generation pour wrath although from different vials. Some may be called upon to hyper-individualize themselves *ad majorem gloriam hominum* or even to offer up their lives, experiencing "all the joy that lies in a full self-sacrifice." These heroes who offer themselves up to the phylum have their own rich meed of honor. But the test of all the ultra-genetic virtues as indeed the ultimate measure of value of home, school, state, church, and all institutions, is service to those who live and

to the unborn who shall spring from our loins. They are all to help us to bear and rear most and best children. This is the sanction of biological as distinct from what we may, borrowing a Kantian phase, call transcendental morality. Thus virtue has two registers or levels as he taught, although they must now be very differently conceived. The antithesis is not between the sensuously impelled and the free will as he taught, nor between Huxley's cosmic and human order, but between the interests of the individual and those of the race and here we do not have a real bifurcation wherever these do not coincide but collide at whatever angle. The truest tragedy today deals with this struggle and no longer with the collision of two opposed virtues as in the case of Jephthah's daughter, or Iphigenia or other Greek drama motives. Nor do we need the casuistry of the Catholic church where cardinal virtues conflict with each other or especially with those lower in the hierarchy of them, so arranged that the lesser shall give way to the virtue of higher grade. The practical antinomy today is between what is good for the person and what is good for humanity. Into this all other moral amphibolies can be resolved.

Again, the impulsion to follow supreme oughtness is not an apprehension of the moral law in itself by a unique faculty of apperception directed to it alone as Kant taught, nor is it a religious feeling of absolute dependence, as Schleiermacher believed, but a no less unique but different feeling *of kind* or as I would call it in default of a better name, a *sensus numinis hominum,* more impulsive than discursive, more unconscious than conscious, a sense of direction or orientation not as to the individual alone but as to the direction in which the race is going. I admit this is as much beyond the present ken of psychology as are gravity tropisms, which distinguish so subtly and inerrantly between up and down. It is a compass which is not deflected (as it so easily may be) but points steadily toward the unknown pole of ultimate human destiny. Conscience, honor, moral sense and even ethical taste are only partial names for it. It says "Live for the race," and it warns or deters as well as impels. It is the soul of the overman in us, not yet born but striving toward birth through all ages and generations *in saecula saeculorum,* the millennial ideal man of the future of whom all moral struggles are the birth throes, with some phases of which we are occupied in every ethical endeavor and of which the moral history of the race is the slowly progressive nativity.

It is an instinct, impulse, *Trieb,* nisus or push up that even

genetic still more any other type of psychology, can not yet name or define. It is not first seen cognitively and assented to, but felt and acted on. It is an *ethos* rather than a *logos,* more *nomos* than the *muthos* in which it is bodied forth. In most acts and throughout most lives, it never comes to consciousness at all. It is more norm than form, from which the sum of consciousness measures the sum of error or departure either actual, conceivable or threatening. Shall we call it the goal of the human species so far as it animates the individual and the sense of direction that pervades the whole journey of life? What is its relation to Providence and is it infallible if heard aright? No one beholds a moral law written within and adores it as astrologists did the starry heavens any more than the bee makes its cell or the spider its web by geometry with appreciation of its meaning. It would take an intelligence as much above ours as ours is above the bee to understand this moral motivation in us as well as we understand that of the bee. Even the greatest specific acts of virtue and heroism are usually done, as von Hartmann says instinct does, viz., " according to a purpose but always unconscious of it." It is a sense of economizing life so as to make and get the most and best possible out of it, as opposed to the prodigal and spendthrift, who squander life on selfish and transient ends. It is thus essentially thumic and not epistemic, these two being somewhat related in the psyche as the spermatic and the somatic in biology. It might clumsily be dubbed an auto-phyleto-philic principle (sense for and love of racial uprightness), but this adjective only designates an essential attribute and not the ipsissimal nature of the impulse.

The moral impulse needs no such analytic or dialectic as Kant subjects it to, because its bottom motif is not *gnosis* but *thumos,* disposition or *Anlage.* The intellect is largely an individual product. Indeed, the intellectual element may interfere with moral practice, knowing with doing. The deliberative element is secondary. In fact, the noetic element is always and by its very nature heteronomous. It involves an object, and objectivization is always heterization, while only autonomy is purely subjective. Virtue impelled by knowledge may be very lofty and almost inspired and actually inspiring but it is always in a second and lower class in the order of moral nobility.

Again, how can freedom, Kant's basal principle, be the foundation of an imperative and that a categorical one, the opposite of freedom? The answer is that this freedom is not

a balance of choice between two or more alternatives but an impulsion that is or ought to be irresistible which nothing in the soul can oppose to keep to the one and only straight and narrow way. It is more like the *non posse peccare* than it is like the *posse non peccare*. It is more essentially impeccable than infallible. We act more wisely than we know and before. We tell why we so acted, if we do so at all, only later and very imperfectly. The virtue that thrills an admiring world springs like the greatest works of art straight up out of the dark abysmal regions of the soul. It is inspirational—from the heart and not the head. We stand in awe and marvel at the native, creative originality in the human soul, for every great moral deed thus impelled is a new thing in the world, a contribution to its moral growth. It is a gift and comes without research or even circumspection. It is new-born out of the great unknown within, beneath and over us. It is thus related to custom (*Sitten*) or morals, a little as the latter is to legalism or codified ethics, the former being one and the latter two removes from it on the scale that measures the grades of implicitness and explicitness.

What is the relation between virtue and happiness as the world knows happiness, i. e., pleasure? As Kant said, the Stoics were partly right, conceiving happiness as the consciousness of virtue, *but* there are pleasures that are not virtues. Also the Epicureans were partly right in conceiving the highest happiness as virtue, *but* much virtue in this world brings pain. The old Hebrew idea was that in a well-ordered moral world righteousness went with pleasure and prosperity meant right doing so that in adversity they examined their consciences, which were thus inflamed. In fact, happiness and virtue do belong together and their union is the *summum bonum*. Now, says Kant, pleasure and virtue do and can never completely unite in this world and so we must postulate a postmortem life in which they are forever one and inseparable. Now this is surely a *tour de force*. On this basis, if the world should ever grow so perfect that the good were happy here and the bad miserable, there would be no longer any need of or argument for immortality to bring them together and a millenium or golden age of this sort, if it ever came, would dispense with a future life for the consummation would be attained here, and to say that they must be united in each person through all eternity is going farther than the argument warrants. Or again, virtue and happiness might be completely united in a posthumous life for a time. Then the consummation would be reached

and life might go out so that we should be sentenced to the reward of heaven for a limited period. But again, is it a psychological fact that all men everywhere do believe that virtue and happiness belong together? Much has been deemed virtue that we now deem vice and there is quite a domain where one man's happiness is another's pain. Moreover, pessimists deny all such relation. To them misery goes with virtue and only optimists are firm in this marriage. Again, some Stoics and Kant himself felt that happiness corrupted virtue.

Once more, Kant's argument only attempts to prove a heaven where a reward is attached to goodness. But does not the instinctive sense of justice exactly as much affirm that sin and woe belong together? Is not this indeed a part of the psychosis that unites goodness and joy so that the belief is incomplete and falters without the former? If so Kant should by the same token have postulated hell as a place of eternal torment.

God, too, he postulates as a necessary being, the cause of both the natural and the moral world, who implanted in us the idea of the union of virtue and happiness and imparts the latter according to these traits of our mind. But who put sin and woe together, as they surely just as much belong, which indeed is only the obverse side of the same fact? Did God do this, or must we not exactly as well postulate a devil to tie these two up by a no less indissoluble bond?[5] Kant did not say and so his story of the practical reason lacks the

[5] God and the devil are sometimes conceived a little as running mates or sparring partners, or as twins, but as opposites, chiefs of kingdoms that divide the world between them. These two personages, together with their respective domains, Heaven and Hell, not only bring out each other by contrast, but have so long gone together historically that if one fades the other tends also to do so. To drop the devil tends to a twilight of faith in God. The doom of one foreshadows that of the other, as the dead moon is the death's head, or *memento mori* to earth of its eventual fate; and all devils are deposed, or ex-gods, as dead planets once lived. All this and more, we see if we psycho-analyze Milton's magnificent Satan. Ought we not to rehabilitate and reinstal the Devil? As Beelzebub, he was god of flies, *i. e.*, of bacteria. In the middle ages the *advocatus diaboli* was leader of the opposition, representing the minority. It was felt that God must not have it too easily, all his own way with no conflict, lest he degenerate, or lose virile quality. The Devil had much to do in conserving the theater, dancing, sports, etc., through a time when the church would have annihilated them. Of these the Devil long kept a sprouting garden or nursery against the time of need. As innocent pleasures cease to be forbidden the Devil's kingdom wanes. This the French diabolists strive to buttress up.

tragic side, vital alike for Christianity and for evolution. Or do the bad just die like beasts and is another life attainable only by the good? Nor are we wandering here from the standpoint of the practical to that of the pure reason for punishments are just as practical in the ethical domain as rewards.

So, too, Kant urges that we can know nothing of God whatever except that he is a power that in us inspires the idea that goodness and happiness belong together and later unites them in heaven. To attempt to know more, to know Him as creator, as preserver, as providence, or even as a person, to define any of his relations to time or space, would be to apply the categories magic-lantern-wise or transcendingly, the *summum malum* of the pure reason. Hebrew prophets and later theologians went far beyond all warrant in giving God other attributes. If virtue and happiness do not both belong and get together there is nothing in the universe to which we have any warrant to apply the word God, for in the Dialectics Kant had shown the fallacy of all such grounds of belief in him. All scepticism of this junction, *arete-hedone,* involves atheism. No Kantian can accept a future life without a God for these two are for him organic unities. Yet there have been those who urged that there might be a next world and a very excellent one, without any Overlord but just a republic or possibly a social democracy, as they have deemed any and every conception of a God a not indispensable hypothesis for this world.

What, then must the modern psychologist of religion and morals conclude concerning these last two postulates? It is, in sum, that they constitute a sophistical construction that falls of its own weight and has very little warrant in the nature of the soul. Comparative religion knows it not for there are great religions embracing a large part of the human race, like Confucianism, Brahmanism, Buddhism, that know or care nothing of God or heaven. Modern ethical culture, although going back to Kant, has no use for God or heaven and holds that hope of the latter corrupts ethical motives. Moreover, the recent studies of the religious and more specifically of the Christian consciousness tend to incline us to regard both God and heaven more and more as immanent and subjective. Both are a state of mind. Again, if virtue and happiness ought to join and do not here, but do so after death, it seems that this world was so badly made that it had to be supplemented by a revised and sublimated edition to the correction of the fiasco this world has proven to be. Once

more, the categorical imperative gets on without pleasure and pain, is above and uncontaminated by them. The supreme ethical impulsion so needs to be disinfected of pleasure and pain that we can never be entirely sure that we are acting from the purest ethical motive unless duty is at least a little painful. Thus, virtue only becomes completely sure of itself when it sees itself in its nascent state if but for an instant apart from those elements with which it has closest affinity. Yet immortality and heaven exist only to alloy or maculate pure duty with the baser element of happiness and to make the right pleasure-toned. Thus a pure dutyist would scorn immortality and heaven as heteronomous. To accept salvation would taint or pollute his conscience or pervert it from the love of right for its own sake to love of the pay for well-doing, while God instead of being an all-pervasive power within the soul of man and of the world is known solely as the deviser of a scheme of postmortem revision of accounts which makes up for defects in the shining yellow metal of pleasure that is just adequate though it is deferred to a sequel or appendix life, all of which is done to even up misfits in the present life. The Kantian heaven is thus on an inferior and epicurean plane. God is knowable only as a repairer of a moral world that was illy made at first and he mended and tinkered the job which its unknown author had botched, by patching it with material of inferior quality. Thus in fine, the only truth in Kant's God-heaven construction is that these postulates have and will long continue to work well as a system of transcendental rewards (and punishments) to supplement the defects of the sublunary system. Righteousness is always the best policy if we take into account both lives, this one and the next. We can afford to suffer here if only it is usuriously made up hereafter.

On passing from the Critique of the Practical Reason (as he scholastically and epistemologically called the moral nature) to Religion Within the Bounds of Pure Reason, Kant takes still another standpoint and reaches conclusions which it is impossible to reconcile with either of the first two Critiques. Religion, we are told, is founded on morality, not conversely, because fear and hope would corrupt. Morality must lead to religion because the *summum bonum* is a necessary ideal of reason to be realized only through the God-idea. Religion must never first incite to virtue and God and heaven must never be moral motives. Still we have to recognize duty as a divine command and this indeed is the essence of religion which seems *revealed* if our duty at first appears to

us in the form of a divine command, and *natural* if we first find our duty and then postulate it afterwards as a divine command. The church is purely a community of those who would oppose evil and advance good in the world. It is visible so far as it is actually wrought out or attainable, and invisible so far as it stands for an unrealized ideal. The true invisible church must be, quantitatively, universal; qualitatively, pure of superstition, fanaticism and sin; relationally, free, a voluntary state; and modally, unchanging. All must rest on the moral faith of reason, for striving for virtue is all God or the church commands. But human nature is weak and so we must add statutory and historical parts which should be merely the vehicles of moral meaning and are without any validity independently of this. Every dogma, e.g., the Trinity, without moral content is worthless. Moral reason alone can interpret Scripture and whatever of it has no moral significance must be dropped. Of themselves, sacred records are of no more value than myth. The ideal is for the moral faith to slough off all the useless statutory and historical elements. Thus the kingdom of God is approached and when it is reached history will cease. (Thus far Kant.)

Against all this, liberal modern ethical theory has nothing to object except this: Kant assumes throughout that the moral faith can make assay of all creeds, ecclesiastical regulations, bibles, church history, etc., and can do so now or at a fixed time or more specifically, that some man or class of men, e.g., philosophers or moralists can do so. This is and will probably remain impossible. When any system allows elements thought for ages to be morally vital to lapse from its consciousness, there is always grave danger, because the folk-soul is so immeasurably larger than individuals, however cultured and gifted or however large a school of men is represented. In fact, all doctrines and traditions ever held were once pragmatically vital and they may become so again. The Immaculate Conception of centuries ago, which now to most seems moral *allotria,* was once vital, so were at certain times and places belief in the resurrection of Lazarus, the conjuring of devils into swine, Jonah and the whale, the sun standing still on Gibeon, the temptation in Eden, etc., but seen now in their true significance and motivation, they fairly glow with ethical light and heat till their patent is forgotten in their latent content and meaning. Man's soul is in all periods vastly wiser than it knows. The Trinity in the sense Kant regarded it was trivial, but its philosophical implications were developed by Hegel later, who made it almost basal. It was

the psychology of centuries projected on the heavens, and theology is now being reconstructed as a precious part of the higher anthropology and heaven as the millenial feature of evolution. Much of Man's dialogue with celestial and infernal powers and personalities is coming to be seen to be in fact only his monologue or soliloquy to himself set off as an imaginary interlocutor. In this new sense we must know God and all supernals rightly to know ourselves. Kant had hardly a foregleam of all that archeology, diplomatology, the higher criticism of the psychology of religion have since done here and hence his mode of dealing with religion is too summary and superficial as well as too logical and mechanically anti-genetic. His intellect was too dry and his soul too wizened to do justice to so vital a thing as religion. His treatise to be sure has had immense historical significance for it loosened the mental soil which theology had trodden down so hard about the religious life and it also provoked the reactions of the warmer hearted Schleiermacher and Jacobi, but in the above, he says little or nothing at all to the modern scholar in these fields and still less to the Christian save what is really elementary and commonplace. We are far beyond all this today and yet there are tyros just awakening to what religion really means and says who need this infant food till their mental teeth are cut. Perhaps the simile of a rubber ring to chew to facilitate dentition would have been better.

Again, religion is more than one specific way of regarding duties, viz., as divine commands. It is not a theory or feeling as to the origin of moral obligation. Kant's argument is that they are not divine and hence religion, as he conceives it, is based on a lie unless indeed this illusion of their celestial origin is only another postulate, false in itself, but justified because it works well to make believe that conscience speaks with the voice of God. If one assumes *vox populi vox dei* would that make public opinion religion and if not, why not? If we regard the flight of birds (Bryant's sea fowl), the inspection of entrails, the marvels of instinct, as God-guided, does it make comparative psychology into a religion? Would Malebranche's occasionalism, which assumed a special creative invention every time soul and body interacted, make all studies of the relation between soma and psyche theology? Is there no true religion without belief in or a theory of God? Is piety nothing but a supernatural sanction of human duty and has Deity no function in the universe save to motivate good conduct in men? In these days of religious psychology to ask such questions is to answer them adversely to Kant,

for it has far transcended the narrow limits he prescribed for it.

Turning now to the third Critique fantastically termed that of the Aesthetic Faculty of Judgment, dealing with the beautiful and the sublime, the term "aesthetic" has its more common art significance rather than designating the sensory field as in the first Critique. First as to quality, beauty must give disinterested satisfaction and it wakes no desire as to the agreeable and the good. There is here no motive to realize anything. Quantitatively, a thing of beauty must please all, although this universal validity is not conceptive but subjective. All these judgments are therefore individual, as to relation; we must feel a general, but not a specific, sense of design; and modally, the satisfaction must seem necessary. The object not only may but must please. Thus all judgments of taste are based more on feeling than on thought.

How false all this is! When we contemplate beauty, do we not either desire to get nearer, more of it, or if it is a work of art, to create it or a better one in the same or in some other field ourselves? The lives of great artists show that the exquisite joy of beholding beauty was often the muse that gave them their first inspiration, and their direction for life. The hedonic narcosis of Schopenhauer is painful and pathological if it does not inspire to create or do. Again, pure passivity in this field is psychologically impossible and perhaps it is in any other. Even the reveries in hearing music are partly of doing, although often in very different spheres. There is no paralysis of will and no nepenthe of desire, but we are at least made to feel better and stronger. We are interested and want to realize.

Nor is it essential that we feel that the object should please all. We know and feel that this picture, e.g., would please children and this combination of colors, savages, etc. The best tastes differ greatly. Cannot I fully enjoy music and yet know that there are those who care not for but are positively pained by it? We wish but do not expect all others to admire as we do. As to relation, the design instead of being essential is, as Helmholtz showed, often a detriment that designates a cheap and spurious art. The very suspicion that the artist planned it all out interferes with the far deeper pleasure that we want to feel and do when we feel that the creation was a spontaneous, irresistible and perhaps unconscious expression out of the very depths of the soul. For thus it makes us feel that the foundations of our being are sound. Thus unpremeditation is one of the great

charms of art. As to the necessity of universal appreciation, do we feel that all not only may but must appreciate the object we call beautiful? If, as Kant says, all these things are feelings and not conceptive, why apply judgments to them. All these are at best only a few descriptive phrases and his hypersystematization here is almost affectation. These platitudes have contributed nothing whatever of value to aesthetics, but have served greatly to retard the day of experimental methods here and have kept this field a tumbling ground of arbitrary individual speculation, often even of romantic constructions which have brought the subject into scientific disrepute. Writers galore have mused and set forth in ponderous tomes their complicated states of mind so long that a few decades ago many felt that this whole region must be given over to dreamland since fantastical, arbitrary and capricious methods and results seemed to dominate.

The *sublime* deals with what is great beyond comparison or indefinite and so is not found in nature, which can only evoke it, but in ourselves. Now, quantity is the chief category, as quality was in judging the beautiful. Whether mathematical or dynamical, we prefer the formless to form. After a negative result of inhibition or a sense of insufficiency, we are impelled to assume a *supersensible substratum* to which we cannot react adequately, even by the imagination. Yet we are pleased to realize that our reason as over against sense can cope with the object. Nature is great, but the soul is superior. Thus quantitatively the sublime is absolutely great, as seen by simple intuition rather than by enumeration or measurement. Qualitatively it pains, then pleases. Relationally, we feel greater than nature and modally, we all must feel the same. Thus all experiences with the sublime are a little harder than those with the beautiful because it brings the negative pleasure of self-subordination. Here, too, the logical mechanism rather interferes than helps.

At this point, the careful reader will probably first think of Kant's starry heavens and the moral will within which he deems the most sublime of all things. Under the above rubrics, the heavens themselves are not sublime for they are only geometrically and dynamically great, that is, they are merely symbols of true sublimity, but if the sublime is within us, why do we feel the initial pain of being insignificant? Modern psychology makes this reductive effect on the self a prime trait of the sublime, which has two directions, one toward what is objectively and the other toward what is subjectively great. The former need by no means transcend all

measurement or be great beyond comparison. It does not detract from Niagara that we know the number of tons of water per hour or a bigger fall in Africa, or from the sun and moon that science can weigh them, or from the stars that we can approximately measure the distance and the size of a few of them. We still feel awe without Kant's absolutism and infinity. Moreover, awe itself has many degrees. It is attuned with fear and hence we feel our insignificance, are depressed and paralyzed, perhaps feel the sentiment of extreme dependence that Schleiermacher made the taproot of religion. To feel awe thus requires certain generous powers of intuition that some seem never for a moment throughout their lives to attain, those namely who never can truly reverence, revere or respect. This involves docility and perhaps in its extreme forms almost a masochistic passion for pure passivity. Desire is instinctive will subjugated to the sense of objective reality to which all is fundamental. It is the subjective idealistic trend of post-Kantian philosophy that has impoverished the treatment of the sublime along with outer causes and has actually weakened this sentiment.

As to the subjectively sublime, our interpretation must today differ radically from that of Kant. Of course it inflates the soul well toward megalomania to think and feel that the grandest objects that seem to be without are really within us and that man is the bearer not to say the creator of his universe. But this is only a delusion of greatness. The conviction or sentiment that we are superior to instead of a part of nature gives only a meretricious sublimity. The true feeling comes with the realization that our thoughts, feelings, will, etc., indeed all we do consciously, are determined by the deeper, surer, stronger processes that work in the subliminal depths of the soul. This is a sense of an energy within, not over, ourselves that makes for truth and righteousness. It is the sense that underneath all our endeavors are everlasting arms; that if our frail bark of consciousness and purpose go to wreck, it sinks to a larger sea, that the racial, i.e., all the propulsive tides of heredity are steering us, and ever seeking to come to expression in our lives. The deeply infused sense is that we see, act and feel, etc., with all that all our forbears have seen, acted, felt, etc., and that these instinctive impulsions steady and sanify, even if owing to the interferences and battered rectifications and accommodations of consciousness they do not always lead us aright. Let us then reverence the starry heavens above and the psycho-physical heredity behind us as the two primal sublimities, one in

space and the other in time, neither of which need or even can possibly be transcended.

Two other points remain in Kant's aesthetics. First he urged that the beautiful and the sublime give an impelling sense of a supersensible subtratum back of the phenomena which evoke it. Essential reality, in fact the *Ding an sich* hidden to the understanding, comes within the range of these judgments, although this is not definite or even demonstrable. The concept of this substratum is always present, though always so vague that we cannot dispute about tastes. It was in carrying this view out that Schopenhauer said that in beauty only we glimpse the blind but basal will to live that makes all the processes of the world go. In the aesthetic domain alone does the veil of Maya lift a little or at least grow thin so that noumena shimmer through. The sense of reality has much to do with overwhelming us when we feel the ecstatically beautiful, or the transcendentally great, says Kant. This ipsissimal entity is what is vaguely recognized. These two sentiments then bring us face to face with the metaphysical nature of things. We transcend experience and break through the categories only at this point. The artist passes in where the epistemologist cannot enter. The poet is a seer who can discern what the philisopher or scientist cannot and alone stands in immediate rapport with things as they are.

Our gloss upon this thought:—it is gratifying that Kantians can touch actuality at any point even in matters of taste, almost as if by palpation. The idealist should be very grateful after the long voyages of discovery that unlike Vanderdecken in the Flying Dutchman, he can make a landfall and be blessed, not cursed, for it, even though when upon the solid shore all is foggy and dim about him. But he now has *terra firma* under his feet and it is no wonder that with this only outlet from phenomenalism aesthetics has since tended in this direction as if it were in a hoppo. Here idealists have been impelled to reinvigorate themselves, like Antaeus by touching Mother Earth. Post-Kantians who felt most shut in found this the easiest way of escape and took it. It was thus Kant came to found subsequent philosophical aestheticism. It meant for his followers quite a general jail delivery. It must however be said that they have all together added precious little to our knowledge of anything in this field, least of all to the supersensible substratum. They have gamboled freely about, but always nearby, without organizing any expeditions to explore this mystic region. The little they have told us of the substratum is neither significant nor ap-

petizing. Indeed, they have really done little but exult in their new sense of freedom.

But reality is not the peculiar appendage of the sense of beauty and sublimity. In fact, the reality thus found is mythic as the grail. A sense of the real reality comes from hard up-against-ness of facts such as welfare workers, laboratory people, scientific managers of industry and business know. This kind of reality is the sternest, nearest and commonest of all things and that in Kant's cloudland of the imagination was only a mirage of it. The manual laborer is nearer to the only true *Ding an sich* than the thinker, poet or painter and what the thinker postulates or the artist glows over is only the remote resonance or phosphorescent effect of this kind of long contact with things from thigmotropism up through all our lines of descent generalized and beatified for contemplation. Kant's own diathesis here as everywhere may be described thus: His consciousness shed an unusually bright light and he examined his soul by its aid with great diligence, but his instinctive *Anlagen*, the lush impulsions within him, in fact all the emotionality and the crasser volitional faculties were so weak and inadequate and the unconscious subsoil of his soul so very shallow that he under estimated it in others and allows it almost no place in his system. His factual contact with life was faint and over small and widely separated surfaces, so he idealized in his aesthetics what he lacked in life. The tinglingly alive man exults through all the Kantian rubrics and in the envisagement of every aspect of nature and of life with a feeling of the supersensible substratum of it all. He does not need to see the world done up in song or framed in a picture in his study to appreciate it. Art only interprets what life means or ought to mean directly in and of itself and it does so only feebly and in patches. Beauty simply intensifies life, gives it all its relish and warmth and vital soul, sees both it and sublimity in all reality, in the meanest flower that grows, in all that lives and is. Isolation and undervitalization or both reserve these feelings for special fields.

Finally, do we feel a supersensible substratum more in beauty and sublimity in which with most laudable optimistic intent Kant reconstructed its avatar? Do we not rather feel it far more in those things that give us pain? Unpleasant are stronger and more varied than pleasant feelings and experiences and if there really be any sense of reality more coercive than another, it is that which we feel toward objects or facts that hurt us. It would therefore have been better

psychology for Kant to have said that tragic experiences reveal the supersensible substratum more clearly than the sense of beauty and sublimity can do. If Kant had located his sunken treasure of the *Ding an sich* in the tragic domain would not those who have since so diligently spaded for it have loosened up far richer soil? "Those who never ate their bread with pain know not the eternal powers" said the far more aesthetical Goethe. Is it not plain that where man has most transformed the world, viz., in industry, invention, discoveries, in social and political organization and throughout the whole struggle for survival in the natural as well as the moral world, which has decimated all species, man included, the sovereign master, pain, has been supreme? This is where pressure in foot pounds against reality has been hardest and not in the individual self indulgence and luxury of contemplating poetry, art, beauty and sublimity.

The other motif is Kant's argument that the beautiful and sublime are after all and at their best only symbols of the good so that as before religion now here aesthetics is ultimately resolvable into ethics. But what now becomes of his former argument that beauty is utterly disinterested and is thus distinct from the good in which we are supremely interested and which awakens the desire to realize it? How, if this is true, can morality be simply good taste in conduct? If the supreme beauty is goodness, we should be supremely interested in it and not disinterested and again, if in beauty we glimpse the supersensible substratum, why does he here reduce it to a mere symbol of goodness? This is surely a *contradictio in abjecto.* No reconciliation between these positions seems possible unless we assume that the *Ding an sich* of beauty is a symbol or type of a still more essential *Ding an sich* of virtue so that we have a hierarchy of entities. Moreover, beauty pleases, but pure oughtness can never please and remain pure. The only escape from this dilemma is to re-formulate on a more natural and modern basis the relation between the two and this involves a rather radical reconstruction of the whole Kantian procedure here. In fact, it is right to say that they are diverse, yet overlapping. There is an art for art's sake, as there is a duty for duty's sake. The difference is more fundamental than the identity. The Kantian beauty is all passivity and its goodness all activity. So each must get by as well as get on to the other (if slang may be applied to things so serious). The beauty of virtue is only seen in contemplating it and the act of doing it has no beauty to the doer at the moment. If it has beauty, it is only for

the beholder and if it has any for the doer, it applies to his deed as seen by him beforehand and afterwards.

Neither can be subordinated as means to the other as end, or as species to genus. One important distinction between them is that duty and the good are more closely related to the present and beauty to the past and future. Beauty consists subjectively rather largely in the awakening of reverberations from the past of the individual and of racial reminiscences in him on the one hand and of anticipations of the future, personal and racial, both of which must be of a predominantly pleasant character. Objects that recall ever so dimly paleo-psychic traces of what has lapsed to rudimentary states or organs in the soul or that awaken general tendencies not yet ready to flower, are beautiful. Thus beauty deals largely with two important classes of psychic objects, viz., vestiges of long ago and buds or promises and potencies of what is to be. This does not necessarily or usually involve any conscious memory or even *déjà vu* feeling. It is often quite impossible to distinguish the ontogenetic from the phylogenetic factor. It is this survival of often massed genera of experiences rather than specific occurrences that have tended to survival that is properly aesthetic. Lost chords are generally sounded again and the soul unconsciously remembers its lost paradise, that is, the best of its past experiences. Now, could we analyze these, they would probably be found to contain much of sex and its wider irradiations, for much of beauty has in the past been correlated with primal and secondary sex qualities and acts. Beauty is in no mean part made up of massed and confused echoes in the soul of what love has been and done in the world all along our line of forbears. It is of old, glowing, haloed, transfigured, a beautiful object. Love is not only the mightiest power of the soul, but the most persistent in the sense that its relics or engrammes are longest perpetuated, but it is also the most plastic, transformable and metamorphic of all. It can be base, sensuous or spiritual and felt toward the good and true as well as toward the beautiful, which contributes so much to give both the affective element. The study of sex aberrations shows that there is hardly an act in human life or an object in the world that cannot and does not in some pervert evoke specific erethism and it is due to this general diffusion and tendency of love in normal souls that it may suffuse anything with special significance for feeling, that is, it may sanctify, beautify or give conviction of truth or underlying noumena, for all of these love can do as nothing else can. And what

did Kant know of love? Without love, how much beauty would there be in the world? How its joys are diffused through woods, hills and vales, shores, mountains, morn, sunrise, sunset, twilight, moonlight, water and landscapes and all scenes in which its ecstasies have been set! It intensifies life, gives the world item by item its emotional view, makes life worth living because it has been and is possible again. In beauty, love is purged of desire and is often little but love of love, and the vast variety of objects from flowers to beautiful human forms are its best symbols, but everything can become so. It makes heroism, speaks through the individual, but is eloquent of the race which is always its real theme. This is the genetic and the prophetic aspect of beauty is hard by. Beauty is thus the sublimation of love and can be perfected only in the future in which, if at all, it will be its apotheosis. Thus, in all experiences of beauty, we step out of the present and to a great extent out of the individual life to expatiate over the wider racial field and recover what was lapsing over this almost boundless domain. The person touches the genus. In duty-goodness on the contrary, we take the issues of the race into the individual and more than that, focus on the *devoir des devoirs presents* and act in the living present. It is not now a question of contemplation, but of doing. We impersonalize ourselves more intensely rather than depersonalize ourselves. It is choosing between and executing deeds and it flourishes most not in quiet but in stirring times. Will takes precedence of feeling. Much, perhaps most, that beauty inspires is unrealizable in the life of the individual, but duty and moral goodness can and must ever be at least approximated. To do no evil is not enough. There must be achievement. The real saint is not idle as the beauty envisager may be. Sanctity and holiness are cheapened if called merely beautiful. The anchorites often outraged the aesthetic ideals of human life and courted ugliness, feeling that they did not belong together, but were opposed, for they thought life must be depurated of beauty somewhat as Kant thought the highest virtue must be of happiness, but they had no aesthetics even where the two could come together. Today we should hardly designate that life as beautiful that was devoted to the strenuous practice of virtue. Art may include, but it is more than morality taught by example. Thus the dear old little sage of Hinter Pomerania gave us neither paradigms nor rescripts for the relations of these two mighty potencies in the soul which our age can use.

Beauty is more closely connected with religion than with

morals, but not with Kant's narrow conception of religion. If beauty is *amor redivivus,* if it may be sublimated as Edwards taught even up into love of being so that "he prayeth best who loveth best," or focused in the great personified moral hypothesis of God, if the best form of worship is that which is the most aesthetic and if a large part of the work of religion in the world, especially Christianity, is to keep love pure, and since the church has inspired so much that is best in all the arts, it would seem that we are now compelled to seek for a deeper bond between them. The very pathologies of the two are akin. Let us begin by roughly characterizing religion as the *art* side, aspect or complement of morality. All its persons, states, places, events are artistic creations not so much of the great religious founders as of the folk soul. So far as genetic psychology can now see, religion is made up warp and woof of imagination. Of the might and dignity of the imagination, Kant knew almost nothing. But religion has always understood its potency and long ago cherished its highest moral function, faith, "the substance of things hoped for, the evidence of things not seen." No philosopher, save Froschammer, who thought the imagination actually cosmothetic or world-building, even began to do it justice and he treated it too much in what we must now almost call the vulgar epistemological sense which construes the world according to subjective or absolute idealism. Psycho-pathology is now realizing its power over health and disease. To say that God, devil, hell and heaven, immortality and all the rest are products of the ontogenic but still more of the phyletic imagination by no means is to assert that there are not real transcendent objects corresponding to them. On the contrary, we might argue precisely as Anselm, Descartes and so many others since have done, that because every race tends to evolve such objects we have a warrant to believe in their objective reality, else the soul is made to lie. This argument is just as pertinent for such products of the imagination as for those of reason. Their independent existence lies in the field of metaphysics or is at least metapsychological and thus belongs to another domain. A critique of these projections of the folk soul is now in order and must be forthcoming, but when it has done its perfect work, it will only sift out those mythopoeic products that are moral from those that are not, those that are universal, that are illy developed from those that are not, for they constitute the very essence of true religion. The hedonic narcosis of these moral art forms that the soul has felt toward Jupiter,

Thor, and Jehovah is worship (worth-ship) or the ascription of supreme value. The fashions in gods and in the interpretations of the God-idea or the attributes stressed change from age to age, more so perhaps than do tables of categories and certainly more than the best formulations of science. But under this change there is in these objectivizations always an essential core that abides. The changes in this domain are pragmatic rather than logical. All these cults, rites, ceremonies are only old conduct or forms of etiquette and deportment toward deities and hence they are imaginated celestial morals. Religion thus beautifies and makes sublime the personifications of the system of virtues of those people who hold it. Thus, while aesthetics includes, as we saw above, only a part of morals, it embraces all of religion. Theology is the anthropology not of man so much as of the great and good section of humanity projected into the cerulean vault. It represents the best of mankind generalized and apotheosized and this is the product of constructive imagination, which makes up its very warp and woof and without which all the pure constructions made by the religious consciousness would, like the airy fabric of dreams, vanish and leave not a wrack behind. Only great and ethical geniuses can work transformingly in this field. What we find here is largely the result of masses of men working unconsciously and through generations. The Kantian logical reason is far too clumsy a tool to work with this material and only a psychology that has come out into the vast genetic domain has now begun to develop the methods and the conceptive apparatus which promise at last and ere long to do it justice. We post-Kantians have almost lost ourselves prowling in the narrow field of consciousness like Dutch patchers under the dikes of logic, which keep out the great sea of truth, but in these days the unconscious is coming to its rights and is bound, if not to be a trifle reckless, to indulge the imagination in making a periscope of possibilities, some of which will ere long become highways of science. The church invisible, the millenium, the judgment day, rewards and punishments and all that pertains to the fate of the soul at and after death, all modes of doing business with the gods and the gods themselves are products of the moral aesthetic, just as atoms, ions, ether, etc., are of the scientific imagination, and the criteria of the value of both is the same, viz., service. In both these realms we must walk by faith, not by sight. Thus, if in these pragmatic days we are learning that the old theory of knowledge and metaphysics was in large part an extravasation

of thought, the genetic psychologist in pronouncing its funeral panegyric must not forget that he owes to them a peculiar debt in that they have made possible a purely scientific treatment of the most sacred teachings of religion by discovering the noetic process of relegating all consideration of objective reality to another domain which he would not and cannot enter without ceasing to be a psychologist. They are like the extruded polar globules for him while he can study the pair that remains.

Further yet, the geneticist sees in the entire idealistic movement, from Berkeley on, only a propaedeutic for religious psychology. All that these thinkers proclaim concerning the phenomenality of the external material world they really meant of the religious cosmos. Their patent content, when psycho-analyzed, reveals as its latent content the fact that the *esse* of the spiritual world is its *percipi, cogitari* and *sentiri.* In fact, the power of the whole world of revelation, dogma and doctrine was fading and the idealists interpreted this *débacle* of faith objectively as a decline of external unreality. The geneticist must ask why they did thus misdiagnose and misinterpret impending spiritual bankruptcy and direct their scepticism toward the natural when in fact it was rooted in the spiritual realm? Why did the lush confidence of the physical science in this when the world of the religionist was fading, not suffer them to sleep, like the laurels of Miltiades? Certainly crude conscious jealousy is not a sufficient answer. We must look deeper for the true psychic momentum of this metathesis. The lover whose mistress has filled all his soul till everything in nature "'minds him of his Jean," when he feels her going away from him finds the world desolate and unreal. The morning song of the lark the rose, dawn and even twilight lose their charm and do not appeal as before. So the soul which, according to Augustine, supremely longs for God and if he is found rests in him, finds all nature transfigured and when God is lost, finds the world fading too. So in the last half of the eighteenth and the first part of the nineteenth century religion and the church, owing to the later results of the Protestant defection, were losing the dominant power they had so long wielded over the soul of man and an intellectual void and an atrophy of heart were superseding. The God-love of cultured Christendom was waxing cold as its object paled and the soul was distraught and disoriented far more and more deeply than it knew. The royal sentiment of conviction was passing over from the domain of faith to that of science. The ark of the

Covenant that held the decalogue was captured by the Philistines and must be won back, for they would never return it voluntarily, as was the case with the ark of old. As the very song of the sparrow erstwhile so cheering to the lover, threatens to break the heart of the rejected swain who would now silence it, so the apostle of the lost older *Pistis* and the newer losing *Gnosis* were tormented by the naïve confidence of observers and experimenters and so instead of reestablishing the spiritual world that had been shattered, they first made an aggressive and destructive raid against the camp of the materialists. But as I said, it was not the mere unconscious jealousy of the new organon of knowledge on the part of the baffled representatives of the old one. The latter like those who suffer from bodily diseases honestly mistook symptoms for a true diagnosis of the nature and cause of the disease. The world without God, heaven and the rest had lost its reality for them. Its old meaning was gone and they could not find or at least could not formulate a new and higher one, for this was the work of generations of thought and research. The faith-world had to be rebuilt slowly, step by step and so an interim scheme must be more hastily evolved to save the remnant of the provisional scheme till the day of new realization dawned. Thus the idealism of this age, later to be psycho-analysed in detail, vicariated for faith bankrupt and led into captivity in a strange land. Thus the objective world seemed phenomenal to those evicted from the old one which had been equipped with all the traditional products of the racial imagination before their psycho-kinetic equivalents in the form of the new statements was found. It took faith a long time to find and make a new home and equip it with new Penates with which the necessity of belief in some kind of creed could be met. The old idealism of the romantic speculation of the heroic age of modern philosophy was thus a regency and is not yet entirely ended, nor will be till genetic psychology is able to establish the old verities in forms palatable to modern thought, that is, to provide new and adequate proxy formularies.

Again, the old religion had glorified man by making him eternally perdurable in another world and as that great hope grew uncertain, he could not allow himself to be divested of this transcendental importance and so invested himself with a new halo of glory in the present world by making himself nothing less than the bearer or creator of it. Indeed, it was made of mind stuff to idealists. Never was such a regal crown offered to man as when his intelligence was made the

organon of all the categories, the maker and projector of the world of sense and even of gods. This was done as a consolation prize for his growing uncertainty concerning the next world. Plato said the soul was so marvelous a thing that even the gods could never have the heart to destroy it and somewhat in the same vein these philosophers, in making the mind cosmothetic and even theothetic, were atoning for a dim sense of loss, and seeking to meet the old need for wish-bred convictions in a new way. Both subjective and objective idealism conceive the human soul as the very apex of the universe. Instead of having his dignity conferred upon him by the gift of immortality man now puts on his own crown of dignity, which he deems so great that he may base upon it his assurance of an hereafter. Instead of being a stranger and an alien here bound for a heavenly home, epistemology made man the pampered petted spoiled child of this world, saved and preserved in the next because he so wanted and expected to be that he must not be disappointed. Indeed, he was too marvelous and precious to be annihilated. Meanwhile, there must be no rival with which the verities of the old faith even in its decline could be compared to their disparagement. Those dissatisfied with the ideal world must not be exposed to the temptation to turn away and gratify the passion to believe, which is so irresistible to every ingenuous soul, in the baser things of sense perception. Thus the speculators of this age were tempted to disparage the studies of the world because they could not solve its problems to the end and pass by strict methods all the way up the long road that leads from nature to nature's God. This they might have done had the biological, psychological and social group of sciences been developed, for in the light of their higher interpretation of even physical science, all would have been easier. The alternative then was either mathematics and physics or morals and religion. Now this gap is so bridged that there is no such alternative, but continuous passage, thanks to evolution, such that if the senses, which are so basal, are undermined the whole superstructure falls and he who attacks the witness of the eye or the ear imperils the kingdom of God. Sense is the fore-school and not the rival of the new faith and the Author of the world does not say one thing in the language of his deeds in nature and another in revelation, but both are parts of one consistent continuous whole, neither complete without the other. Everything in both fields is a problem to be even further investigated by kindred objective scientific methods. The idealists

perpetuated the old disastrous warfare between them which, as Mr. White's book has shown, is the tragedy of the Christian ages. They devised new weapons, fought the old battles in new and higher fields. The science of their day was not only narrow, but nearsighted, ever tending to crass empiricism or to formal deductive mathematical methods. Science then was utterly unable to cope with vital problems or to meet social needs. Hence the struggle that Kant sought to adjust was not ripe for adjudication and the terms of his truce seem now little better than learned scholastic jargon and those who study him too intensively as a finality are held up as it were in a past age, slaying the slain and crowning the victors over again. They are thus kept from vital touch with the living present. Miracles, inspiration, immortality and all these questions of our own and other faiths are now studied by psychologists natural-history-wise and also by analytical methods which chemists and engineers respect. Scientists have had the grace not to attempt to lay down laws of procedure to their philosophical colleagues, although they have the most venerable and trusted of all oracles, mathematics, on their side. The soul students on the other hand have not yet learned to forbear the wasteful and absurd effort to prescribe this for the former. In fact it is more to Kant's influence than to any other source that we still have the too common spectacle even today of young theorists of knowledge making pompous proclamation to scientists as to what they can, cannot, ought, ought not, know and do, what axioms, principles, concepts, methods they should use and laying down comprehensive surveys of scientific results and prescribing its logical canons on high *a priori* grounds, even for the laboratory. (I hesitate to mention a long and growing list of names and titles I have collected during the last five years of those who thus assume the right of eminent domain over the whole scientific territory; like the hero of a Gilbert-Sullivan opera enumerating another set of preposterous or typical faddists, "I have them on my list and they never would be missed." Better half a term of physics than a cycle of this Cathay!) Did any man of science ever profit by or even read of these erudite lucubrations, these solemn adjudications or high *cothurnus* injunctions which to those who do saturate their minds with them give the most vacuous of all the many forms of the conceit of knowledge without a suspicion or even the most diluted tincture of its substance?

The Kantian epistemology is thus only an attenuated or

sublimated continuation of the old warfare between religion or rather theology and science (which Draper and A. D. White have described) brought from the transcendental into the realm of immanent soul life. The old naïve Greek confidence in life and the pristine nearness of rapport with nature is here challenged in the interests of categories instead of supernal personalities and post-mortem states of existence. The old and crumbling partition in the soul between reason and empirical reality instead of being allowed to fall away and be forgotten is cobbled and patched up and the solidarity of interests and the intussusception of growths which now tends to go on between them have been retarded. The Kantians should profit by considering the fate of the old theologies and orthodoxies and this quaint system should henceforth be studied only historically and analytically as a precious product of the *Zeitgeist* of the past rather than of our own day, the interpretation of which latter is our crying need.

Before leaving this Critique, we may ask why we need to believe, for it is not, as James urged a *will* to believe, but something deeper which his type of mind (so blind to every evolutionary aspect of life) so tinglingly and completely expressed and confessed in his extraordinarily developed self-consciousness of his mental processes. The answer is, "We *must* believe, i.e., we must add *pistis to gnosis* largely if not chiefly because and just so far as we both as individuals and as members of a stirp are not yet fully developed but have a future greater than our past." Those on the other hand who represent the last stage of human degeneration cannot have faith, for everything for and in them has been realized, their entelechy attained. Every superstition, *Aberglaube* or extra or superfluous belief is instinct with the fore-feeling of greater things ahead. These things constitute the soul's feeling of being pregnant with the superman yet to be. They are taking and staking out squatter rights, preempting domains in new regions felt to be destined to become seats of empire later. But the last man exhibiting a later stage of human decrepitude and doddering old age will not have or find faith on earth, for faith is the spoon food to fledgling faculties which have not yet cut their teeth and can only mumble solid pabulum. Nascent stages of the soul's long upward viaticum need tenuous because tentative objects, platonic myths, even dogmas which they can believe because they are absurd, to keep the mental sutures from knitting together prematurely. They need a domain where they can flout reason and even its very best interpretations. Just here lie

the powers and potencies of the larger science that is to be. Every growing mind then ought to have one or more surds in its composition, if only used in the sense of what piano tuners call the "wolf" or the key into which all the discrepancies between the natural and the tempered scale are tuned. Thus science unsupplemented by imagination is a moribund thing, for the latter is the organon of the heart, which has in it not only greater but more dimensions than the intellect; and Kant was a pure thinker, almost a man without heart and moreover, the day of the study of feelings had not yet dawned. Yet as feelings are never to be repressed, they dominate, though only in the form of tendencies, or determinants, directing the form of about every position which Kant took, as psycho-analysis, which consists largely in finding the feeling motivations of thought, is beginning to show. These things really motivated all that what he called pure reason did.

Once more, the world will not accept any hard and fast distinction between what is true to live by and what is true *per se*. Science of course knows no such distinction. We do not easily accustom ourselves to the idea that certain things are verities and others that are at variance with them and utterly undemonstrable are true as postulates for conduct. We want to wear in our daily life mental goods that will wash and do up well in the laundry of reason. Otherwise morality lacks impetus and is falsetto. Such a schism is too much like the old distinction the church long made between the verities of reason and those of faith. It involves incipient duality of personality. We must know whether an author is talking in his first or in his second manner, voice or register. Pragmatism would obliterate this distinction by making practical truth not merely supreme but all, but pure reason and science can never be all reduced to practice, can never be entirely pragmatic, nor yet admit of two standards or criteria. Now Kant must have felt that his postulates were built upon foundations of sand and hence sought to compensate by the *Überdeterminierung* which appears in his compulsive and imperious categorical imperative and also by the very position he took that the practical was higher than the pure reason. This, be it noted, he did with of course perfect conscious sincerity and without being aware of the deeper motive but he could have done so with plenary conviction from the psycho-analytic standpoint. He was too logical a thinker not to be intensely subconscious of both his standardization and the handicap under which it made him

labor. The knight errants, it is said, often fought hardest and with the blindest abandon for a mistress whose reputation they dimly felt or even feared to be a little questionable, in order to fight down their own doubts by overcoming the authors or mongers of scandal. So too, on the same principle, young Mormons, if they show to the elders of the church the slightest signs of growing skepticism of their faith, are sent out as missionaries because it is realized that by convincing others they will most efficiently convince themselves. Thus Kant became most enthusiastic against his wont and temperament as a toreador of virtue because his oughtness lacked the sanctions of his logic. *Sustineo quae abstineo.* In the second Critique only he wrote a lapidary style or to change the trope his weft of thought is highly painted and embroidered by affectivity. After saying that freedom, God, immortality cannot be proven or disproven, he postulates them as the *only* basis and justification of virtue. Now, if an inquisitor of the old days had said, "Very good, therefore these must be enforced by an *auto da fé*" what would Kant have had to object? Rather must he need have applauded. If certain beliefs are essential to good conduct, even though they be ideas that ethical culturists deny, why must not such beliefs be enforced by the very same authorities and the same pains and penalties as the virtues to which they are basal? Again, one faculty of the soul cannot thrive when acting under the conviction of folly by another. We cannot think by one set of categories and act by another however named (principles and postulates). Hence here again Kant must be convicted of putting asunder (this time more violently than in divorcing the sensory and the understanding) what God or nature joined. To act *as if God*, soul and freedom were real is the nursery way of postulating Santa Claus, Jack Frost, the black man, the stork baby bringer, etc. More yet, these Kantian hypotheses are justified on the same principle as the rabbit's foot, the horse chestnut, the red yarn around the neck, which are true if, when, and in so far as they work well, that is, make the right tonic and therapeutic appeal to the imagination. Once more, if philosophy is the system of facilitations or *Bahnungen* connecting all parts of the brain and thought by methods of easiest and most rapid transit (making a degree of unity and efficiency of thought and conduct that is nearest to the standard always set by the economic operations of organic life where staff and line methods are best combined), then Kant falls below the standards already attained by empirical genetic psy-

chology, which knows no such schism, and his scheme for us as a whole is a clever curio but at the same time a serious warning to us, whatever we do, not to sin against the integrity of the soul. Its parts must be knit more closely together rather than disrupted. His is thus a dual, bifurcated, two-souled system and Hegel was right in accusing him of double housekeeping. One showed him to be a logician conjuring deftly with categories and the modes of the syllogism, while the other showed him to be a rarefied religionist whose theology, whose innate and early piety was distilled into rubrics of moral sanctions in which the dogmas are only sublimated or, to change the figure, adduced and used only as a set of collateral securities. Like Zarathustra he was alternately a denizen of two worlds, one of the cerulean blue of the true truth and the other the lower, turbid, murky world of accommodation to mortal needs.

Design, says Kant, is external, i.e., relative and mechanical; or secondly, internal and organic, i.e., where each part is at the same time end and means. Final cause cannot be explained mechanically in this latter domain. The opposition between the two theses—"all is mechanical" and "all is design" vanishes if both are conceived as only regulative or subjective and not constructive. We can never decide whether inner cause exists essentially in nature; we can only know that our judgment must regard nature as designed. To a mind that could not proceed discursively from part to part as we must, but which could look at all things intuitively and simultaneously rather than as proceeding from parts and individuals to the universe, or from the parts to a whole, etc., all nature would seem an *e pluribus unum* or as constituted by the same principle. Such a mind would not need nor indeed be able to form the idea of design.

Now if there is immanent design in nature or if immediate intuition of it is possible, then the standpoint of subjective idealism is transcended and his Critique of the faculty of judgment would be hardly less discrepant from both the other Critiques than they are from each other. What Kant only suggested here was taken up later by Schelling who severely criticized Kant's provincialism in philosophy, his ignorance of its history, even of Leibniz and Descartes, the unfitness of his scheme of things to be generally adopted, made cardinal and developed. In his first period Schelling himself taught that nature is visible mind and mind invisible nature, that there is absolute identity between them, that the same absolute ap-

pears in nature and in man, that there is no need of carrying over from one to the other, for nature is mind's *Doppelbild*. From these principles, Schelling derived the unity of all dualities and oppositions. Thus the objective world is independent and automatic and all knowledge is harmony of the subjective and objective. It is equally right to derive mind from nature and nature from mind. Matter is extinct mind which science and philosophy reanimate.

Kant was the first of the great quartette, the three latter of whom, Fichte, Schelling and Hegel, all in diverse senses and degrees lay concealed in Kant and in whom he stood revealed. When these later systems declined, the cry was "back to Kant" with the feeling that his work at least would not have to be all done over again. Kant did his best to reason out a coherent view of the world, to make a catharsis of all superfluities of belief and to inaugurate a new type of consciousness that should crown man with a new dignity. He was not like Schelling, impelled to utter as fully as possible every stage of his own psychic growth, moulting system after system, as he documented successive stages of his development with little care for the consistency or the conformity of one with another, thereby affording the very best of all data in the whole history of philosophy for psycho-genetic study, Plato himself being, considering the uncertainty that still lingers concerning the order of his dialogues, inferior to Schelling in this respect. If Kant's theories about nebulae (which seem to have been connected in his mind with his utterly baseless conjecture of one central sun in the universe somewhere, perhaps Sirius) involved in any sense a fore-gleam of evolution, Schelling's scheme of the ascending orders of life, applied by Oken in greater detail to the animal series, gives a far more interesting picture of "evolution before evolution." We have seen how Schelling began his work just where Kant fell short of transcending subjectivism. Schelling was a prose-writing poet of nature and of her relations to man, ardent as Kant was frigid, sanguine as Kant was bilious, as the old phrenologists defined these terms. Fichte suggests the reincarnation of the old Hebrew prophet of righteousness—magisterial, magnetic, eloquent, uncompromising, soldierly, patriotic, and he aspired to be almost an infallible pope in the matter of morals. He too wove, cut and made a unique suit of habiliments that just fitted his soul and set thereby new fashions in the realm of *Sartor resartus* which a few even today affect. Given such a man as he and who knows that the future psycho-geneticist and analyst

may not be able to predict with considerable accuracy what sort of a speculative philosophy he would evolve! No system in the whole historic series of them must have made the gods so jealous as Fichte's, for his heaven-storming, world-creating ego seems to involve the unpardonable sin of the old Greek dramatists, that of rivaling heaven and thinking thoughts unfitting man's estate. Had Fichte lived under the reign of Zeus, he would have been blasted by his thunderbolts, or like Prometheus chained to a solitary rock. The most absolute of all egoists, he was in all his *thun* and *sagen* the embodiment of Kant's categorical imperative which set out to construct a mode of knowing the world that should be not unworthy the supreme dignity of man in it. Each man's essential self is the ultimate monadic *thing in itself*, to make it absolute is his sole duty and end in life and moral deeds are supreme above the achievements of speculation. To give duty priority over reason in his day when rationalism was almost a mania, placing it above even the categories was indeed to install it upon the very highest of all pedestals.

Hegel too lit his torch at the light Kant kindled. Instead of a dozen he postulated many more categories, he assumed that instead of being isolated and independent they were not to be assumed as originally given or created, but that they were products of an evolution which needed a new logic to explain it, that their developmental history must be given to show that they sprung from a single source and were so connected that when all the missing links were fully restored, thought could have an organic unity unknown before. It was to this end that a new method and logic were devised as a kind of logos or world soul. This slowly maturing ox-eyed Swabian, like his great Catholic prototype, St. Thomas Aquinas, sought thus to more than think God's thoughts after him, to rehearse his processes in creation and to be his interpreter to the world. Hegel's God was the superpersonal Absolute or God as he existed unrevealed before creation and independently of it, very God of very God, as pantheists conceive him. Hegel's logic is thus the genetic psychology of this supreme Deity who inhabits eternity, as he forever was, is and will be, who not only *did* make but *must* make time and space and all that in them is for reasons that can be fully set forth, for as fate rules Zeus, so Hegel's logic is not only a genetic derivation, and construction of God, but also the constitution by which he must act. The Hegelian web or diamond network of categories laid bare the system of necessity back of and determining every process of the absolute

*Geist.* Idealism could go no further and there remained nothing more to be explained. Thus in Goethe's phrase, all the garments we see God by were woven in the roaring loom of time or we might better add that the X-rays for the first time were turned upon and revealed the ipsissimal nature of God. Probably never in the history of the world (outside Catholicism at least) has any philosophical system been so influential or dominated all the special sciences as did that of Hegel in the day of his perigee. Each department of knowledge was assigned its place, its method prescribed, each scientist was told what he ought to do and could and what not, was told what his science really meant. Everything was inventoried, evaluated and many things transvalued. Did the culture world escape more narrowly than it knew from a new Protestant papal dominion, organized according to the principles of scientific measurements and efficiency inaugurated by this autocratic privy councilor, to whom the monarch's court and even office holders did homage and to whose ideas about all professors in all departments had at least to define their relations, which some of them did with almost courtierlike obsequiousness? Yet all this was only Kant's soul marching on. The little cloud in a spotless sky the day he died, which a soldier said was his soul, had indeed spread over the entire German sky. This cloud, if one may quote so vile a pun, as Tom Hood said of George the Third, rained as long as it could rain and then it mizzled, and it mists even yet.

When the three great post-Kantians (not to mention Schopenhauer here) slowly declined in influence and their kingdom of thought began to break up it was natural that their disciples should raise the cry—"back to Kant," for he was the focus to which so many lines before had converged and from which so many later diverged. He was the solidest of them all and the cloth of glory he wove had the firmest texture, the best warp and woof, seemed compared with others of good measure, a yard wide and, as has been shown, washed well. Hence arose the neo-Kantians and even the Kant philologists who treated his texts as exegetes treat Scripture codices. This new-old base line upon which the army of idealists had fallen back had to be reconstructed, intrenched, fortified, provisioned with new facts from the newly opened, well tilled and fertile lands of science which had meanwhile been very productive. Vaihinger, Cohen, Uphues, Watson, Hartenstein, Wallace, Morris, Porter, Knight and many others edited, résuméd, explained and made a new

aftermath of Kantian literature. Kant was the last stronghold of the old Teutonic ultra-idealism where the old guard must make their final stand and win or die. Inverting the law of megalomania and delusions of greatness as laid down in a masterly way by Magnan, the persecutors have become the persecuted and even I in this note am perhaps unconsciously and more than I know feeding fat the ancient grudge I bear the big four for absorbing so much of the energy of my own best years, which might have been better spent and for the waste of which I am myself an awful warning against this peculiarly inebriating speculative debauchery. Outside the specific professional holophrastic followers of Kant, today there are many still, even in psychological laboratories, who seek to make new blends of science and speculation and subject even experimental data to epistemological tests as irrelevant as theological soundness is to biology.

The days of this confusion are, however, happily ending. The first great step toward betterment was taken decades ago when the new school of the history of philosophy, represented by Trendelenburg, Fischer and Zeller began. Realising that the old symptoms had spent their force and could never be treated or regarded as finalities, the new canons of historicity aimed to set forth every system of the past as purely a product of its time and its author, and as directed chiefly towards its contemporaries. To regard it as pertinent to the present was deemed antiquarian and to make any one of the old systems supreme as a form of psychic arrest. As the higher criticism showed that the Hebrew prophets expressed only their own time and never predicted or sought to do so, so all these systems historians sought to offer up on the altar of the muse of history as dead products to be studied and reviewed only if we wish to revive the past.

Now, however, we are just entering upon a new and still higher third stage of reactions to these old systems, that of critical analytic psychology which seems destined to become the new queen in this domain. From its most advanced position, viz., that of geneticism, it is beginning to ask what speculators really meant by what they said, for if this can be found, they may after all have sense and meaning for us. Geneticism brings a new key to unlock deeper meanings, which will show that the processes and results of the old systems are really symbols demanding a new interpretation, that that which the authors thought they were doing and saying was very different from that which they were in fact doing and saying. The impending analysis of all the great systems

is the inevitable result then of the new dominance of genetic psychology and owes little, save terms and suggestions, to the Freudian analysis of neuropaths and yet we must do the latter ample justice and there is one very suggestive analogy and difference between them. As Freudians find sex, so our analysis finds religion at the root of all. Religion is a passion of the soul comparable in universality and intensity with sex, like it subject to and even made morbific by repressions. Like sex too, religion has left the soul full of its secondary qualities which it originated and inculcated, but has often left later to stand for themselves, so that their *de facto* religious origin is not apparent. As much all over the aesthetic field is due to the long circuiting of sex, so speculative philosophy is only the long circuiting of religion, and its sublimation into the intellectual field. As the root impulse of sex is to propagate another generation, so the root impulse of religion is to prolong the life of the individual by getting his soul born into another world. Both are forms of Schopenhauer's will to live, which is the *Grund-Trieb* of all life. Heaven is a product of the nest-building impulse, for our souls are to be reborn in this celestial world which the folk soul has created and made ready for them. God is a uni-personal dynasty that insures safe transit to and land-fall in a gloriously organized and permanent home into which he who dies is ushered so that life is thus made transcendentally worth while in the *Jenseits*. Virtue is such conduct and regimen as will make us sure of immortality and of being well and not meanly born into the next life. Ceremonials are other-world conduct and worship is mindfulness of and heartening ourselves by the thought of this destiny. Offerings suggest that we must give up some objects of sense here to insure happiness hereafter. Theology is the philosophy of the next world and is pure pragmatism, judged from its own standpoint. The church is the insurance society that prescribes the moral regimen conducive to postmortem existence and well-being. The struggle for survival beyond is thus a mighty power and religion is a system of selective agencies. Like sex, it has manifold perversions and fanaticism, it is aggressive or sadistic, or it is quietistic, passive or masochistic. Both have their fanatics, perverts and inverts (cf. Morse). Now to psycho-analyse a philosophical system of the universe, we must first of all establish a set of symbolisms or psycho-kinetic equivalents. For a personal God, we must substitute an impersonal power that makes for righteousness, the great revealer of all things. His invisibility is translated as his metaphysical noumenal

character back of phenomena; for explicit revelation we read immanent laws; for heaven, the attainment of our highest desire or perhaps the ideal state of the future man here, the fulfilment always of fundamental wishes, the *summum bonum;* for the love of passion, the *amor intellectus dei;* for immortality, the intellectual intuition that participates in God by knowing his ways, and the deathlessness attainable here which is not, however, personal, for personality is a lower category; for demonstration of the reality of the ego, the immediate sense that we think (*cogito, ergo sum*), feel free and responsible, desire pleasure and are averse to pain, and push on from the empirical to the absolute ego; for Scripture, the tomes of the dialectic philosophers; for priestcraft, the craft of the system builders; for confessors, their ethical theorizations; for sects, schools of philosophy; for tables of the law, tables of categories; for vision, speculation, which means looking on the processional of either thought or things within or without us; for indoctrination, rationalization, the desire to understand, accept and live according to the systems; for the Holy Ghost or spirit of truth, the logos or logic of the world; for miracles, the necessity of surds and postulates to be assumed; for the church, the philosophers' state. With such keys we translate from the religious to the philosophic consciousness or vice-versa. Of course this list of equipollent terms is by no means as yet either accurate or complete. Of course too the philosophers did not realise that they were at root religionists, fighting over again the old battles with naturalism, only with new and newly named as well as improved weapons. They and the church were ships that pass in the night and each thought the other hostile. Just how much the noblest of all the doctrines of Kant—that of the categorical imperative or autonomous oughtness—he owed to his mother's teachings concerning the still small voice of the Holy Ghost; how much his characterization of the sublime, his sense of his own insignificance when he was stargazing, was due to the old magnificats of the Almighty who inhabited eternity; how much the satisfaction he felt in beauty was suggested by the ecstatic contemplative state of religious mystics; how his practical reason is faith in new terms; his phenomenalism motivated by the religious *vanitas vanitatum* of world-sick pietists from Solomon down; and indeed, how far his very subjective idealism that exalted man as the bearer of the world well up toward parity with the God who created it, was only construing into this life some of the pledges of glory that of old awaited man hereafter so as to realise at

least partially here from the securities fully redeemable only in the next world—all this is itself as yet only speculation. But, whatever theme we touch we shall, if I mistake not, find it to be essentially a restatement in new terminology of ancient religious notions, so that the whole of these systems is religion re-thought. In all their polemics against science and in their disparagements of nature, they were really defending the interests of the church and it is high time that the church should recognize its advance guard.

The demonstration of this thesis in detail is yet to be wrought out. It is of course not claimed that religion is pathological. The justification of the above general proposition can only be carried through by long, painstaking labor. The inhibitions of religion have been many and strong, like those of sex in hystericals, although these great men of course are by no means hysterical. But their religious consciousness and experience give us really the clue which we must follow. If we trace out in their systems all the substitutes, and transfers, patiently detect every complex *Verschiebung, Uberdeterminietheit, Verdichtung, Censur,* etc., we shall realise the underlying identity of their philosophy with religion. These idealists really sought to set forth the latest and most advanced form of religion and their chief merit depends upon whether or not their methods were right and their results with these efforts were useful. That is the criterion by which we must judge them. Their views were only the sublimation of the religious consciousness.

The key of Kant's philosophy is his person, his age and his habitat. Born, living and dying in a remote provincial city which he never once left more than a day's stage journey; knowing almost nothing of the great world by personal observation; leading the simplest, most regular and monotonous of all lives; a man with little physique, five feet tall; delicate in health, hygienically fussing, often almost hypochondriac, doctoring himself; strongly averse to the clergy as a class, never having entered a church during his mature years, despite the pious heritage of his mother, who died when he was thirteen; hardly less hostile to doctors whom he distrusted and still more so to lawyers; a bachelor and an insistent censor of woman and her ways, of whom, if all his sayings were gathered and coordinated, they would almost make a fourth critique; not even speaking to his own two sisters who were domestics, for twenty years, one of whom nursed him in his last days of most distressing decrepitude; never having seen an art gallery; of humble origin, the son of a strapmaker, and

poor all his life till his wretchedly paid professorship at the age of 46 did give him the means of living comfortably with great economy; knowing almost nothing of science, save physics and mathematics together with a little geography and a gossipy anthropology, on all of which he lectured before he turned to philosophy; mostly ignorant of Greek and caring little for music, save that of the military bands in his garrison city which the young soldiers whom he lectured much liked; idolized during his later life; formal, methodic; loving the companionship of his inferiors, and excessively deferential to his superiors as seen in his often fulsome dedications, rather the fashion of his day; inept with men of the world; amazingly ignorant as has been abundantly shown of the history of philosophy, even that just preceding his own day;—he rather naturally became the embodiment of criticism, which was the very spirit of his age by which he was caught up, for it was a day when reason was the academic as in the days of the French Revolution it had been made the popular goddess. Kant might almost be called the leading representative and the mouthpiece of the *éclaircissement* of his day. Every institution and every type of culture and belief were being subjected to revision and criticism, but reason meant deductive logic and science meant physics and mathematics, while philosophy meant metaphysics. Kant knew the world only intellectually and through the medium of books and he saw it only in the dry light of intellect. For his *Gemüth* or emotionality, life was almost undeveloped, save in and from few directions and in these but slightly, and his academic seclusion was almost isolation from the world of action. His deeds, which Carlyle says are the only actions of complete men, consist in thinking in his study with his eyes almost hypnotically focused upon the distant church spire, so that he was upset when it was hidden by the twigs of a growing tree, or upon the brass button of one of his students which had to be restored before he was able to lecture well again. He was old when he was young in years and what little youth he ever experienced was in the form of a certain limited mellowness and second childhood as he grew old. Senescence was hard on him and his faculties decayed, one eye even growing blind twenty years before his death at the age of eighty. He had become petulant, physically emaciated, a quaint little mannikin, pestered by trifles, positively worried over the attentions his great fame had given him and over his letters. Yet he was comfortable to the end and his extreme and rigid economy revealed to the amaze-

ment of every one an estate of nearly $16,000 and a library of 500 volumes.

To conclude, Kantianism is one of the antique cumbersome systems of regarding the world that belong only to the museums of the history of philosophy. It is not a scheme for our time and to install its antiquated gearing in eager and youthful minds very greatly reduces their efficiency for the world's work to-day. Its thought machinery is wasteful, very ponderous and requires immense mind power to run it. To change the trope, it is like an old battle ship that did good service in its day, but should be drydocked, because afloat it is a derelict and a menace and no one who knows what a modern warship is and can do would think of embarking in it, but would be content to visit and inspect it as a curious relic of bygone days. A few of its timbers are marvelously sound and can be built into new constructions, but as it stands in Hartenstein's eight volumes, it is utterly unseaworthy. Kant restated many of the eternal verities of religion in terms that made them more efficient for the culture of his day, so that he marked a distinct stage of advance. Modern pragmatism is stating the same old truths in a still more effective way which approximates still further towards the scientific standpoint. But even pragmatism, which decants this old wine of meaning into still newer bottles, makes them more appetizing to the scientific palate and should be heartily welcomed as a further step towards closing the chasm between religion and science, while it has immense significance and amounts indeed to a new dispensation for the old speculative philosophies, has no significance whatever for science to which it has nothing to tell, to give or teach, for from the very start, science has been through and through pragmatic. Indeed, the most advanced pragmatism is only a dilution of scientific principles with speculative and religious tinctures. It is simply a fresh step in the auto-therapy of culture illustrating the *vis curatrix animi*. For science, it still contains some of the old virus of alienation. From direct, close, immediate intuition of facts and things it directs observation not to nature but to the process by which we know it. It involves introversion or introspection of activities that should not be subjected to consciousness, which interferes with their perfect operation; it is like the anxious examination of the patient's own heart, stomach, liver, eyes, etc., the subjectivization of which is impossible and unnatural with perfect circulation and digestion. Pragmatism is at best then a movement which lies entirely within

the field of epistemology, which is itself of only limited and qualified value, but this new movement is one towards its sanification in that it is a little less tainted with hypochondria. True science has always been and must forever be pragmatic, but is liable to be injured if it becomes conscious even of this fact. Pragmatism has reduced the percentage of inefficiency of both subjective and absolute idealism, but is itself much below the standard of efficiency set by science. It is simply the philosophy of pedagogy transfigured, glorified and given a new name, taught by new disciples. It sets forth the rationale of adjustment to nascent stages and recognizes that even cultivated adults are only children of larger growth. Like pedagogy, it is genetic rather than logical, but science in its higher modern sense, including the study of all that is in physical nature, in man, religion, etc., both requires and illustrates a higher standardization and a greater efficiency. We may thus safely conclude that from this point of view, it is high time that the present widespread academic cult of Kant and his successors in academic institutions be greatly reduced, since the excessive cult of this method is not only wasteful of the best thing life has to give—youth and enthusiasm—but is pernicious.

# PROLEGOMENA TO A STUDY OF INTROSPECTION

By E. B. Titchener

We are not likely to remark, in any but a vague and general way, a change in which we are essentially concerned; *tempora mutantur, nos et mutamur in illis.* Yet those who remember the psychological laboratories of twenty years ago can hardly escape an occasional shock of contrast which, for the moment, throws into vivid relief the difference between the old order and the new. The experimenter of the early nineties trusted, first of all, in his instruments; chronoscope and kymograph and tachistoscope were—it is hardly an exaggeration to say—of more importance than the observer; and the observer had nothing more difficult to do than to analyse a chord, or to report the 'fluctuation of attention,' or to trace schematically the course of successive association. There were still vast reaches of the mental life which experiment had not touched; we believed, at least the enthusiasts among us, that the method would some day carry us to them; meanwhile, certain chapters of psychology were written rather in the light of 'system' than by the aid of fact. Now, twenty years after, we have changed all that. The movement towards qualitative analysis has culminated in what is called, with a certain redundancy of expression, the method of 'systematic experimental introspection.' Our graduate students—far better trained, it is true, than we were in our generation—sit down cheerfully to introspective tasks such as we had not dreamed of. And it is when some second-year graduate brings in a sheaf of reports upon Understanding or Belief, upon Recognition or Judgment, that the director of a laboratory has his historic sense aroused, and wonders what he, at the same age, could have made of a similar problem.

But if the individual is thus disposed to take for granted the development of the science, it is true, on the other hand, that his indifference is offset by a kind of self-consciousness on the part of the science itself. A great change has taken place, intensively and extensively, in the conduct of the introspective method; and with this practical change there has

grown up, naturally and as it were instinctively, a tendency to discuss the method, to trace its application, to classify the errors to which it is exposed, to set forth its scope and its limitations. What we knew about introspection, twenty years ago, is very fairly summed up in such a book as Sully's *Human Mind*.[1] To-day, if we are still far from agreement and from perfect comprehension, we have at least progressed beyond the stage of generalities to that of monographic detail. And our interest in method is evidenced on all hands: within the space of a year there have appeared Müller's special study of introspection in the field of memory,[2] and the more general articles by Anschütz,[3] Dugas,[4] de Sanctis[5] and Dodge.[5a]

In this and the following articles I shall be concerned with various phases of the introspective method, and with certain questions that are suggested by its use. I begin, in the present paper, with brief comment upon a number of special points. The treatment makes no pretence to be adequate, though it is, I hope, less scrappy in fact than it is in appearance. At all events, the following paragraphs express a single attitude toward psychology; and I deemed it unwise to attempt a description of the introspective method until I had defined, in this preliminary way, my position upon various controverted questions.

## 1. *The Status praesens*

It is worth while, at the outset, to define the standing of introspection as psychological method; and to this end we must know the opinions of the leading psychologists of our time. Let us take them country by country.

Stumpf affirms that experimental psychology is "in the main nothing else than a method for inciting, systematically and with objective control of conditions, to introspection."[6] Lipps declares that "the method

[1] J. Sully, *The Human Mind, a Text-book of Psychology*, i., 1892, 14 ff.

[2] G. E. Müller, *Zur Analyse der Gedächtnistätigkeit und des Vorstellungsverlaufes*, i., 1911, 61 ff.

[3] G. Anschütz, Ueber die Methoden der Psychologie, *Arch. f. d. ges. Psych.*, xx, 1911, 414 ff.

[4] L. Dugas, L'introspection, *Revue philos.*, lxxii, 1911, 606 ff.

[5] S. de Sanctis, I metodi della psicologia moderna, *Rivista di Psicologia*, viii., 1912, no. 1; reprinted in *Contributi psicologici del laboratorio di psicologia sperimentale della r. Universita di Roma*, i., 1910-1911.

[5a] R. Dodge, The Theory and Limitations of Introspection, this JOURNAL, xxiii, 1912, 214 ff.

[6] C. Stumpf, *Erscheinungen und Funktionen*, 1907, 25 *note*.

(*Weg*) of psychology is first, last and everywhere the method of direct observation of the facts; . . . and this again is primarily introspection."[7] Wundt writes, in the same spirit: "The supreme advantage of the experimental method lies in the fact that it and it alone renders a reliable introspection possible, and that it therefore increases our ability to deal introspectively with processes not directly accessible to modification from without."[8] Müller, in his special context, tells us that "the scientific study of memory, if it is to be complete, cannot dispense with introspection," and that his own results "rest in large measure upon the use of the subjective method;"[9] and Anschütz, taking a more general survey of the field, characterises introspection as the "direct, primary, fundamental or essential method" of psychology.[10] Has Germany need of further witnesses? I will call only on Möbius: "Empirical psychology can be nothing else than introspection elaborated by reflection."[11]

"The first and indispensable source of knowledge of mental facts is the introspection of these facts by the individual who experiences them;"[12] "the foundation of psychological investigation is experience of the psychical facts; . . . this direct apprehension is usually termed introspection."[13] So speak Austrian psychologists.

"Introspection," says Binet, "is the basis of psychology; it characterises psychology in so precise a way that every study which is made by introspection deserves to be called psychological, while every study which is made by another method belongs to some other science."[14] Ribot, despite his championship of objective methods, is not far behind: "The method of introspection . . . is the fundamental method of psychology, the necessary condition of all the others. . . . The aptitude for introspection is not given to everyone; some possess it in high degree; these are the born psychologists."[15] And Dugas concludes his critical study in like terms: "Introspection is the fundamental, original and peculiar method of psychology."[16]

From France I turn to Italy. "The professional psychologists of our day," remarks Villa, "are agreed that introspection is the necessary and indispensable point of departure for any examination of psychical facts." De Sanctis describes the general methods of psychology as "introspection, actual or implied, in its two forms of autointrospection and heterointrospection, confirmed and controlled by comparative external observation and by experiment." Introspection, he continues, is "the fundamental though not the exclusive method in psychology;" "all those who aim to be psychologists must, wherever possible, invoke the testimony of the observer's consciousness, or, if this appeal is ruled out by the nature of the procedure adopted,

[7] T. Lipps, *Leitfaden der Psychologie*, 1906, 42.
[8] W. Wundt, *Grundzüge der physiol. Psychologie*, i., 1908, 7.
[9] *Op. cit.*, 63.
[10] *Op. cit.*, 448.
[11] P. J. Möbius, *Die Hoffnungslosigkeit aller Psychologie*, 1907, 13.
[12] A. Höfler, *Psychologie*, 1897, 7.
[13] S. Witasek, *Grundlinien der Psychologie*, 1908, 92 f.
[14] A. Binet, *Introduction à la psychologie expérimentale*, 1894, 18.
[15] T. Ribot, in *De la méthode dans les sciences*, 1909, 230 f.
[16] *Op. cit.*, 625.

must be able logically to supply that testimony, and must be governed accordingly in the drawing of psychological conclusions."[17]

Psychological method receives but scanty treatment in Ward's *Psychology*. We have, however, the following definite statement: "Psychology may be individualistic without being confined exclusively to the introspective method. There is nothing to hinder the psychologist from employing the materials furnished by his observations of other men, of infants, of the lower animals, or of the insane; nothing to hinder him taking counsel with the philologist or even the physiologist, provided always he can show the psychological bearings of those facts which are not directly psychological."[18] Stout echoes and amplifies this doctrine as follows: "The psychologist has at his command a vast mass of data which are not due to introspection. . . . Thus we might have a kind of psychology without introspection, and yet quite distinct from physiology. What introspection does is to supply us with a direct instead of a hypothetical knowledge of mental process. It thus forms a source of psychological material which is invaluable and unattainable by any other means."[19] McDougall writes that "psychology finds itself compelled in an ever-increasing degree to recognise the co-operation in all mental process of factors that are unconscious and so cannot be introspectively observed; and though some of these may be inferred from the nature of the processes revealed by introspection, others can only be inferred from the study of movements and other bodily changes." Yet we read, in another place: "The physiological psychologist must avoid the error . . . of neglecting or despising the refinements and subtleties of the introspective psychologists. He must admit the primacy of introspective psychology, must recognise that all the objective methods of psychological study presuppose the results of the subjective or introspective method and can only be fruitful in so far as they are based upon an accurate introspective analysis of mental processes."[20] Myers, finally, lays it down as "a golden rule that introspection should never be omitted in a psychological experiment. . . . The dangers of directly deducing the mental state of an individual from observation of his behavior cannot be too strongly emphasised."[20]

James speaks emphatically: "Introspective observation is what we have to rely on first and foremost and always."[21] Ladd writes more cautiously of introspection itself; but he adds that "the method of indirect observation is inevitably connected with, and dependent upon, the method of introspection;" so that, for better or for worse, this direct method is the one reliance of psychology.[22] "The whole work of our

[17] G. Villa, La question des methodes en psychologie, *Rev. scientifique*, quatrième série, t. xiv., 22 Sept. 1900, 357 col. 1; cf. 359 col. 2, 362 col. 1 *sub fin.* See also the same author's *Contemporary Psychology*, 1903, 152, 164; ch. iv. must be read with caution, since the word Introspection carries different meanings. S. de Sanctis, *op. cit.*, 9, 14, 15.

[18] J. Ward, Psychology, in *Encyc. Britannica*, xxii. 1911, 548; cf. 599. G. F. Stout, A Manual of Psychology, 1907, 16.

[19] W. McDougall, *Physiological Psychology*, 1905, 2, 12 f.

[20] C. S. Myers, *A Text-book of Experimental Psychology*, i, 1911, 4.

[21] W. James, *Principles of Psychology*, i, 1890, 185.

[22] G. T. Ladd, *Psychology, Descriptive and Explanatory*, 1894, 14 ff., 20. Cf. G. T. Ladd and R. S. Woodworth, *Elements of Physiological Psychology*, 1911, 5: "It is only by the method of introspection that the actual and present facts of human consciousness can be reached."

modern psychophysical laboratories," says Münsterberg, "must be characterised as essentially introspection, but introspection under artificial conditions." [23] Hall strikes a dissentient note. "Formerly everyone supposed that self-observation, or looking in upon our own psychic processes, or the intensification of self-consciousness, was the oracle and muse of philosophic studies. Now, however, . . . it is coming to be seen that this method gives us access to but a very small part of the soul, as, like an iceberg, nine-tenths of which is submerged under water and only one-tenth is visible above the surface of the sea, in the same way unconscious and instinctive forces now seem to be dominant in human life, . . . and these can be studied only objectively by natural-history methods. We can reach this more comprehensive knowledge only by carefully recording descriptions of what we see in others." [24] This position is found in some recent text-books,[25] and appears also to be that of Dodge: "Introspection is only one of the indicators of mental reality. It is a real and important indicator, of peculiar value in special fields, but it is only one of many." [26]

I think that these quotations are representative, both of the science of psychology and of the authors quoted. If we may take them as representative, the following conclusions emerge:

(1) It is maintained that, were introspection impossible, we might still have a science of 'psychology,' a system of observations and inferences which could not be subsumed to any existing science. This assertion cannot, so far as I see, logically be gainsaid, though one may doubt whether in fact the 'psychology' would have arisen. The issue, however, does not seem to be worth debating.

(2) It is maintained that, for the description of the subject-matter of psychology, 'objective' as well as 'subjective' methods are necessary or valuable; in other words, that certain psychological facts must or may be obtained otherwise than (directly or indirectly) by way of introspection. I believe that this position, too, is logically defensible; but I am not sure that any psychological facts can be identified as facts obtained by objective methods.

By 'psychological facts' I do not mean 'facts which are of value to the system of psychology,' but—since we are talking of method—'facts got by psychologising.' The rigorous distinction of psychology, psychophysics and physiology has been called pedantic. I am sure, however, that the terms, strictly used, stand for three different attitudes toward experience, for three different forms of scientific interrogatory, and that

[23] H Münsterberg, *Psychology and Life*, 1899, 124.

[24] G. S. Hall, A Children's Institute, *Harper's Monthly Magazine*, cxx, 1910, 621.

[25] C. H. Judd, *Psychology: General Introduction*, 1907, 7; E. L. Thorndike, *The Elements of Psychology*, 1905, 321; perhaps, too, W. B. Pillsbury, *The Essentials of Psychology*, 1911, 6 f. It is not always easy to interpret the brief statement of method found in text-books.

[26] *Op. cit.*, 229.

to run them together indistinguishably is not to escape pedantry, but is rather to lapse from clear thinking.[26a]

I see, now, no logical reason why we should not, as things are, add to our knowledge, for instance, of the psychological nature of emotion by strictly objective observation. But I find no clear evidence of such attainment of psychological knowledge; the facts and uniformities due to objective observation appear to be, in every case, psychophysical or physiological. Perhaps some of those who habitually psychologise by objective methods may be induced, by this statement, to give an explicit account of their procedure and its results; discussion will be profitable in proportion as it deals with particulars. On the other hand, I find upon psychological facts which purport to be derived objectively an evident, sometimes a flagrantly evident, coloring of empathy or of introspective analogy. I therefore agree with Angell that "observation of others often makes us sensitive to psychological processes in ourselves which we should otherwise overlook," but that this is in practice the limit of its application.[27] The logical possibility of an 'objective' enrichment of psychology remains.

[26a] I suppose that, in theory, the number of the sciences is indefinitely large; that there may be as many different sciences as there are discriminable cognitive attitudes to the empirical universe. In practice, however, the number will always be finite; the limitations of human interest, the pressure of practical needs, the narrow range of attainable fact, these and many other influences will always be at work to direct and restrict the scientific activity of an epoch. The sciences that we find established, or in course of establishment, thus correspond to cognitive attitudes which have received some sort of sanction from the *Zeitgeist*. Certain of these attitudes are still gross, and will presently be differentiated; others perhaps are mistakenly distinguished, and will presently be identified, or at least brought into relation. Meanwhile, the investigator follows his problem,—in the light of all the knowledge that he can obtain, and in any direction that seems to lead toward solution. He may, in his pursuit, take up many diverse attitudes; and who that knows the difficulty of constructive work in science will say him nay? Only it is well that he should change his attitude, not blindly and confusedly, but with realisation; that he should always, as we say, be 'sure of his ground'; that he should not ignore the methodology of his time, but should test and, if possible, improve it; and that, if he removes distinctions, he should transcend and synthetise rather than just obliterate.—

I add this Note after reading the Symposium on the Relations of Psychology and Medical Education published in the *Journ. Amer. Med. Assn.*, lviii., 1912, 909 ff. And I may end it by quoting the Baconian maxim: quod omnes scientiarum partitiones ita intelligantur et adhibeantur, ut scientias potius signent aut distinguant, quam secent et divellant.

[27] J. R. Angell, *Psychology*, 1904, 5. The terms 'objective' and 'subjective' are, perhaps, open to misunderstanding; for in one—and that a very important—sense the domain of introspection is no less 'objective' to psychology than is the field of external observation to physics or to biology. "The really objective method in psychology," says Lipps (*op. cit.*, 47), "is the observation of one's own conscious life. Without this, every method is subjective, i. e., is a method of arbitrary interpretation and of confirmation of preconceived opinions." In the present connection, 'subjective' means introspective, and 'objective' means non-introspective; I take the words as I find them, without prejudice to a future definition.

(3) It is maintained that introspection is the one distinctively psychological method, and that all objective data must, if they are to become psychological, be interpreted in the light of introspection. This position seems to represent our actual practice in psychology, and to possess a logical warrant at least as strong as that of its rival.[28]

Finally, if we consider the quoted passages from another point of view, we may conclude that

(4) The method of introspection, despite all attacks made upon it, is regarded by the great majority of present-day psychologists as the most important means of psychological knowledge; and that

(5) The method attacked and the method upheld are, in some instances, methods of an entirely different character; the term introspection is equivocal.

2. *Gross Differences in the Meaning of 'Introspection'*

(1) There is still need to distinguish the introspection of the psychological laboratory from the introspection of a moralising common-sense. For novelists and essayists are still ready to declare that the exercise of the introspective method is unwholesome; they speak of a morbid introspection; they advise us to eschew it, not to become preoccupied with our inner experience. The classical warning is that of Kant, who cautions his readers against keeping a diary of their thoughts and feelings; that way, he says, lie extravagance, distortion of perspective, perhaps madness itself.[29] I remember that, even in my own time at Leipsic, the student of experimental psychology was told, half in jest but fully half in earnest, that he ran the risk of the insane asylum. And within this twentieth century the reviewer of one of my books gravely doubts the after-effect upon character of certain prescribed experiments; dangerous possibilities are involved, risks to nerves; some curiosities are only to be gratified at too great a cost!

This misunderstanding hinges, of course, upon the meaning given to self-observation. Introspection, let us admit, is self-observation. And if by that we mean, as popular psychology means, a study of mind not for its sake but for ours; an

[28] It is the position taken, among writers of recent text-books, by M. W. Calkins, *A First Book in Psychology*, 1910, 6; R. M. Yerkes, *Introduction to Psychology*, 1911, 39. As regards logic, Wundt declares roundly (*Philos. Studien*, iv, 1888, 304): "Eine derartige Methode [eine Methode die bloss objektiv wäre, d. h. die Selbstbeobachtung ausschlösse] für die Psychologie verlangen, hiesse meines Erachtens eine Sinnlosigkeit verlangen."

[29] I. Kant, *Anthropologie in pragmatischer Hinsicht*, 1798, 11.

appraisal of our mental possessions; an absorption, anxious or complacent, in the strength of our intellect. the delicacy of our sentiments, the firmness of our resolution: then certainly self-observation is morbid and egotistical; we are living in a world of fictitious values. But if self-observation means, simply, psychological observation; and if observation in psychology has as its end a knowledge of mind, and not the glorifying or humiliation of the observer: then, just as certainly, introspection may be as impersonal, as objective, as matter-of-fact, as is the observation of the natural sciences. The psychologist observes himself, not because he thinks he is especially admirable, nor because he feels a peculiar need to keep watch over his inner life; in these respects he stands on the same level with all the rest of the world, and behaves as any other, non-psychological individual may behave; he observes himself, because his mind is the only mind directly accessible to him, and mind is the topic of his professional interest.

(2) More important, however, is the distinction of the critical and the precritical use of introspection. The precritical method has been roundly condemned by Comte, Lange and Maudsley. "We have no place," cries Comte, "we have no place, under any pretext, for this illusory psychology which is the final transformation of theology . . . This pretended psychological method is null and void in its very essence and conception . . . For two thousand years the metaphysicians have been cultivating psychology by its aid; and they cannot yet agree upon a single proposition that is intelligible and solidly established. . . . Introspection gives rise to almost as many divergent opinions as there are individuals who rely upon it."[30] Lange writes in like vein: "It would be quite useless to offer a prize to anyone who should hunt out a single real observation in the two thick volumes [of Fortlage's *System*]. . . . The boasted system of self-observation seems to be so much liked precisely because of its defects. For even though, as Kant feared, enthusiasm and hallucination are not in its train, yet it will always continue a means of lending to the most fanciful imaginations of metaphysic the appearance of empirical deduction."[31] And Maudsley complains that "there is no agreement between those who have acquired the power of introspection; and men of apparently equal cultivation and capacity will, with the utmost sincerity and confi-

[30] A. Comte, *Cours de philosophie positive*, i, 1830, 34 ff.
[31] F. A. Lange, *History of Materialism* (tr. E. C. Thomas), iii, 1892, 171 ff.

dence, lay down inconsistent or directly contradictory propositions. . . . There is no witness who is so easily suborned to give false evidence, and whose testimony at all times requires such stringent cross-examination, as self-consciousness." [32]

The truth contained in these criticisms may, I think, be summed up in two propositions, which at the same time bring out the narrowness of the critical attitude. There is a great deal of error in the introspection of the precritical, pre-experimental period; but the error is due to the fact that the introspection was not a direct observation, but essentially a reflective interpretation in terms of some philosophical system.[33] There is, on the other hand, a great deal of true observation mixed in with the interpretation (Wundt has a good word to say even for Fortlage;[34] and Möbius points out that the oldest psychological achievement, the naming of our inner states, is also the greatest);[35] but the psychologists of a pre-critical, pre-comparative, pre-experimental day were at a woeful disadvantage; they had no criterion of general validity; they had no means of distinguishing the universal from the particular, or the objectively observed from the construc-

[32] H. Maudsley, *The Physiology of Mind*, 1876, 16 f. Yet the same author writes in the same book (47) that the results of introspection "must, in the hands of competent men, be as useful as they are indispensable." Who is to judge of competence, if "there is no agreement between those who have acquired the power of introspection?" And how can a method be indispensable, if "it is of little value, because it has reference only to a small part of that for which its testimony is invoked" (18 f.)?

[33] Wundt has dealt faithfully with this phase of the question in various publications: e. g., *Beiträge zur Theorie der Sinneswahrnehmung*, 1862, Einleitung, xvi, ff.; Selbstbeobachtung und innere Wahrnehmung, *Philos. Studien*, iv, 1888, 292 ff.; Die Aufgaben der experimentellen Psychologie, *Essays*, 1906, 196 ff.; *Logik*, iii, 1908, 163 ff.; *Grundzüge der physiol. Psychologie*, i, 1908, 6, 419. Müller (*op. cit.*, 147) sketches the procedure as follows: "If one compares the hopeless sterility of these philosophical expositions with the overwhelming abundance of interesting and important facts that introspection has brought to light in the field of memory since the advent of experimental psychology, one is forced to conclude: the much vaunted introspective method of the philosophers was, in essentials, nothing else than the method of 'putative recollection.' The philosopher, who in all probability means to dispose of the doctrine of memory in a few days or even in a few hours, sits down to write, and tries by the aid of recollection to give an account of the regular course of the operations of memory in his own experience. The results obtained accord with the method employed."

[34] *Philos. Studien*, iv, 1888, 297: " . . . diesem Psychologen, bei dem sich manche feine und gute Bemerkungen finden . . . ;" ct. *Grundz. d. physiol. Psychol.*, i, 1908, 6.

[35] *Op. cit.*, 13.

tively rationalised. Rightly to appreciate the method of the older psychology, then, one has to compare it with the Aristotelian physics, or with Schelling's and Hegel's philosophy of nature; one has to think of such books as Grotius' *De jure belli et pacis* or, at a lower level, as Browne's *Pseudodoxia epidemica*. The reader of these works, coming to them in the critical attitude of the nineteenth century, wonders that men of such grasp, such sanity, such learning, could also have been so warped, so trivial, so inconsequent, so lacking in perspective. There is no harm in the wonder; that may be the first step towards understanding. But our trio of critics pass straight from wonder to exaggeration; and then, having exaggerated, they condemn.

3. *Contradictory Results from Scientific Introspection*

Current introspection—the conduct of which I propose to discuss in another paper—is, therefore, to be distinguished from the introspection either of a moralising common-sense or of a rationalising philosophy. But current introspection, however safeguarded, does not itself bring us, in every case, to uniformity of result. I have referred elsewhere to a well-known instance.[36] Mach and Stumpf sat down together before a harmonium, in the physical laboratory at Prague, to decide the question whether attention to one of the component tones of an ordinary musical chord does or does not strengthen that particular tone. Mach declared that the intensification was quite clear; Stumpf could find no trace of intensive change. A like divergence, on a larger scale, has resulted from recent studies of the processes of thought; some observers find, while others as definitely fail to find, a non-imaginal element of thought. What is the value of a method which lands us in difficulties of this sort?

Those who see in this question the last word of destructive criticism may be reminded that no scientific method is infallible. Not long ago there was much talk about the *n*-rays; there has been a good deal of dispute about the electrically positive or negative character of certain radioactive phenomena; and there are still, I believe, astronomers who look sceptically upon the Flagstaff maps of the Martian canals. The difference between Mach and Stumpf is, after all, no more radical than the difference between two histologists, the one of whom reads anastomosis and the other mechanical apposition from the preparation before him. And the difference between, say, Bühler and Angell is no more radical

[36] *Feeling and Attention*, 1908, 215 f.

than that between two physiologists the one of whom holds a myogenic, the other a neurogenic theory of the heart-beat. Psychology is not the only science in which the strict application of the best available method leads to opposite conclusions.[37]

But is there the same hope, in psychology, that the differences will presently be resolved? I see no reason for any but an affirmative answer. Repeated observations have shown me, *e.g.*, that Mach's result is often due to a confusion of tonal intensity with tonal clearness or vividness; let this confusion be cleared up, and an observer who has judged as Mach will now judge as Stumpf. Here, then, is a possible—and a very simple—explanation of the discrepancy. Should it prove, on trial, that Mach is free of this confusion, we are by no means at the end of our introspective tether: it may be that expectant attention gives rise, in his mind, to an intensive image, a sort of hallucination of the expected tone; such cases are known; and if the suggestion were verified, we could accept Stumpf's hypothesis of individual difference. But let both these explanations fail,—still there is no reason to despair: a more methodical series of observations, with variation of conditions, would either bring the two observers into agreement or would give us the key to their disagreement.

The question of the thought-element is more complicated; and its answer must come by way of a progressive refinement of method and a progressive differentiation of points of attack. No one will deny that the method of 'systematic experimental introspection' has furthered the psychology of thought and volition; no one, I imagine, supposes that the method has attained—has even approximated—its definitive form. It will probably emerge from its time of trial as a number of specific procedures, each one addressed to some specific aspect of the problem, and all alike safeguarded against preventible error; in other words, as a group of typical methods, comparable perhaps with the metric methods of psychophysics. The refinement and the differentiation will, however, need time and the cooperative labour of many minds.

[37] Here is a pretty illustration: *Nature* for Oct. 1, 1908, prints side by side two physiological addresses; *The Relation of Physiology to Physics and Chemistry*, by J. S. Haldane, and *The Manifestations of the Principles of Chemical Mechanics in the Living Plant*, by F. F. Blackman (lxxviii, 553,556). The writers' conclusions are as different as they could well be. But if physiology flourishes in defiance of such division against itself, psychology need not be concerned at a controversy regarding the thought-processes.

A scientific movement should be judged at its best, and not at its worst: what should we think of the Freudian doctrines if we knew only the extravagances of their popular statement and the superficialities of some of their champions? Crude work has been done, no doubt, in the name of experimental introspection; crude work is done by the unskilled in every department of science. "Some of the studies in which introspection has been pushed farthest"—so a recent critic tells us [38]—"seem to approach the limit of uncritical procedure:" the meaning is that certain studies in which the writer has professed an exclusive or predominating reliance upon introspection are thus uncritical. I heartily agree. But in all fairness two remarks should be added: that work as uncritical has been done with professed reliance upon objective experimentation; and that 'some of the studies in which introspection has been pushed farthest' are ensamples of critical caution.

A criticism that constantly recurs, not in psychology only but in all the sciences, is the charge of preconception, of bias, on the part of the observer. "More than once it has been pointed out that the individual's answer to the question [of imageless thought] depends largely on the school in which he was trained. . . . At the heart of the matter I believe the real problem is not whether a given observer always finds sensory factors in the analysis of all his mental experience, but how any observer with the usual training could avoid finding them, whether they were necessary parts of that experience or not." [39] It seems to me that the criticism, as thus formulated, fails to hold the balance between two necessary but opposed factors in scientific progress, and that it is, accordingly, both unjust in temper and mistaken in fact. We have to recognise, on the one hand, that scientific advance, whether critical or constructive, is impossible apart from theoretical preconception. "How can a man have a critical judgment in scientific questions," asks Wundt, "and at the same time be impartial?" [40] And how, we might add, can a man put any question to mind or to nature without showing, in the very wording of his question, that he has been influenced by theory? [41] On the other hand, the history of science proves conclusively that a particular preconception, even though it is stamped with the highest scientific authority, and even though it may be fatal to the individual, is not a permanent bar to progress. Sooner or later, observations made in a given theoretical interest will be seen not to fit the theory; sooner or

[38] R. Dodge, *op. cit.*, 214 f.

[39] *Ibid.*, 223; cf. R. M. Ogden, *Psychol. Bulletin*, viii, 1911, 330 f.

[40] Ueber empirische und metaphysische Psychologie, *Arch. f. d. ges. Psych.*, ii, 1904, 334.

[41] A brilliant defence of unguided observation is offered by H. H. Turner, The Characteristics of the Observational Sciences, *Nature*, lxxxvii, 1911, 289 ff. "The perception of the need for observations, the faith that something will come of them, and the skill and energy to act on that faith—these qualities . . . have at least as much to do with the advance of Science as the formulation of a theory, even of a correct theory" (290). I should reply that the 'faith' and the 'perception of a need' represent a certain form of what I have called theoretical preconception; they constitute a bias, a guiding motive. It is not necessary that the observer take sides for or against a special theory: the point is that his observations are selective, and not made wholly at random.

later, observers 'with the usual training' will strike out new theories of their own.[42]

The criticism, then, fails to hold the balance between the necessity of a theoretical setting for observation and the investigator's readiness to correct or to change his theory in the light of observation. If it were valid, men of like training would always think alike, the pupil would never break away from the master, and the course of scientific advance would illustrate the preformational view of evolution. If it were valid, criticism would always be immanent, confirming or attacking from within the logical structure of a system, and the conflicts of nativism and empiricism, voluntarism and intellectualism, and their like, would be unknown.[43]

### 4. *Introspection and Self-consciousness*

There is, of course, a sense in which the introspecting psychologist may be termed 'self'-conscious; he is observing 'his own mind,' the only mind directly accessible to him. And if nothing more were meant by the term self-observation, or by the statement that introspection is an interrogation of self-consciousness, no objection could be raised. But self-observation and self-consciousness are terms with many meanings. It is consequently difficult, at times, to know just what a writer intends by their use; and it is easy to misinterpret, even to caricature a perfectly harmless statement. I have no wish to

[42] An instance is given by Turner, *op. cit.*, 292. Instructive in the same connection is A. Schuster, *The Progress of Physics during Thirty-three Years*, 1908.

Müller (*op. cit.*, 159) has a relevant passage. "The trained and experienced psychologist knows how often a really experimental study of the mental processes which appear under determinate conditions has led to the recognition that these processes have a different character, or take a different course, from that which had earlier been assumed on the ground of certain general preconceptions. He knows how often, in experiments which he has carried out himself, the course of the mental processes has been radically different from that which he had previously imagined; how often, in cases in which, as he thought, all the possibilities were familiar to him, the actual course of the experiments has shown that there was still another possibility, of which he had not the slightest inkling. Thus it was formerly thought self-evident that, in the comparison of two successive impressions, the perception of the second stimulus was always accompanied by a memory image of the first; though this view of the mechanism of comparison leads and led to a number of consequences which are often enough contradicted by experience."

[43] Anschütz (*op. cit.*, 491) deals with this matter as follows: "That experiment is for the most part simply a means of confirming preconceived opinions is an assertion which, while it may be true in occasional instances, can be maintained only by those who have themselves made as yet no serious experiment, and who assuredly have not experienced the very fruitful suggestion that even the most acute of *a priori* thinkers may derive from it." I may perhaps be allowed to refer also to my *Feeling and Attention*, 48, 198, 293 f.

exaggerate, and therefore I shall in this section be sparing with references; but I wish to be clear, and therefore I shall risk the charge of exaggeration.

I have the impression, then, that certain psychologists, in writing of self-observation, think of the 'mind' as in some way 'turning in upon itself,' very much as one might fancifully conceive of the eyes as turning about to view the brain; that this mental gymnastic appeals to them as something far more difficult of performance than the direction of the mind to the outer world; and that they are thus led to regard self-observation as the mind's crowning achievement, the signal difference between man and the lower animals. Mind, in some fashion, consciously makes itself its own object; gets out of itself, and then turns round to examine the self which it has left. I have the impression, further, that the self-consciousness which is thought by these psychologists to be involved in introspection in understood *im prägnanten Sinne;* that the psychological observer is supposed to be aware of himself as introspecting himself, aware of himself as observer and aware of himself as observed, while at the same time he is aware of the relation of the two selves, of the observing attitude which the one assumes to the other. If I am mistaken, so much the better; my account may still stand as a possible interpretation of loose speech, and as a warning against carelessness of statement.

For, as a matter of fact, introspection knows nothing of this sort of mind or self and its performances. Introspection is an interrogation of experience; as such, it issues either from a present conscious purpose or from a habit of observation which is the resultant of previous conscious purpose; and, in so far, it is the expression of 'reflection' or of 'reflective thought.' In so far, but no farther: it implies self-consciousness only in the sense and to the degree in which all scientific observation, that of physics and chemistry included, implies self-consciousness. Mental development must have reached a certain level before science is at all possible; but when science has become possible, the conditions are given for a psychology as well as for a physics and a physiology; the data of matter, of life and of mind are observable in essentially the same way. The older psychologies, however explicit as regards the difficulties and dangers of introspection, never describe the actual conduct of the method; nor could they if they had tried; for introspection on the schema which their authors imagined for it is a logical absurdity. But traditions are long in dying, and authority plays its part even in science—

with the result, in this present connection, that the sections on Method in a great many modern books are still sadly inadequate to the facts upon which the exposition of psychology is grounded.

In illustration of the views which I am here criticising, I will quote first a passage from Ward. "Not only is it not the same thing to feel and to know that you feel; but it might even be held to be a different thing still to know that you feel and to know that you know that you feel —such being the difference perhaps between ordinary reflection and psychological introspection."[44] The passage is expanded by Stout as follows: "The most important drawback [to introspection] is that the mind in watching its own workings must necessarily have its attention divided between two objects,—on the one hand, the mental operation itself which is to be observed, and on the other, the object to which this mental operation is directed. If I observe the process of seeing, I must attend at once to what is seen, and to the seeing of it. If I observe what takes place in attending, I must first attend to something, and then to the process of attention."[45] Subtleties of this sort perplex the student unnecessarily: though a few introspective exercises, under the conditions of the laboratory, may be relied upon to dispel the perplexity.

I refer, secondly, to a well-known passage in James' *Principles*. "It is very difficult, introspectively, to see the transitive parts for what they really are. . . . The attempt at introspective analysis in these cases is in fact like seizing a spinning top to catch its motion, or trying to turn up the gas quick enough to see how the darkness looks. And the challenge to *produce* these psychoses . . . is as unfair as Zeno's treatment of the advocates of motion . . ."[46] But for the picturesqueness of the style, the sentences might have come from Maudsley.[47] It is only fair to add that James has previously given us an admirable account of introspection; that he is here writing in polemical vein; and that his later exposition shows how we may indeed 'produce' the psychoses in question without thereby annihilating them.

Finally, I mention the doctrine of introspection that Dürr sets forth in his continuation of Ebbinghaus' *Psychologie*. Our consciousness of time, Dürr thinks, can be accounted for only if we postulate 'acts of primary recollection,' in which we apprehend the 'just past' character of conscious contents: in which, that is, we are aware that a certain sensation was present a moment ago, that a certain idea just now cropped up, that a certain feeling was just now aroused.[48] These acts of recollection are 'produced acts of self-consciousness;' in other words, they are acts of self-consciousness that are directly dependent upon, or are immediately touched off by, such experiences as are fitted to serve as their vehicle or ground; they are not 'reproduced,' but stand to their conscious conditions in the relation which feeling bears to its con-

[44] *Op. cit.*, 599. The passage occurs also in the earlier form of the article.

[45] *Op. cit.*, 18. E. Rabier (*Leçons de philosophie*, i, 1896, 35) makes the 'drawback' an impossibility; "attention," he says, "is indivisible."

[46] *Op. cit.*, i, 243 f.

[47] *Op. cit.*, 17 (*c*). Maudsley himself gets the objection from Comte.

[48] H. Ebbinghaus u. E. Dürr, *Grundzüge d. Psychol.*, i, 1911, 503; ii, 1911, 221. The term 'act' is technical, corresponding to what Stumpf calls *Funktion* (i, 3).

ditioning sensation, or a melody to its conditioning tones.[49] Grant their existence, and the problem of introspection receives an 'excessively simple' solution: introspection is nothing else than "an enhancement of the conscious status of the acts of self-consciousness which are productively aroused by every experience."[50] Simplicity has its acknowledged charms; but, in this particular case, I must say with Marbe: "Diese Ansicht ist mir keineswegs geläufig."[51]

I have referred, purposely, to writers of unquestioned merit. If they are infected with the virus of self-consciousness, in the sense of this section, we may assume the same infection in psychologists of weaker constitution. To go further into detail would be to anticipate the topic of my next paper.

### 5. *Is Introspection Necessarily a Conscious Process?*

It is often said that introspection is itself a conscious process, and that therefore psychological observation must—by the introduction of this new conscious process—interfere with the consciousness which it aims to observe. The objection, again, takes us back to Kant: "psychological observation by its very nature alters and distorts the state of the observed object."[52] Kant was not an enthusiast on the subject of psychology.

We might, now, meet the objection on its own ground. Grant that the act of observing is an experience of the same kind as the experience that you wish to observe; and grant that its introduction must accordingly alter the total consciousness in which that experience is set. Still, the act of observing would, after practice, after it had become a habit, be essentially the same in all observations; the change that it made in consciousness would therefore be a definite, constant change,—a change which you might not be able to estimate or describe, but which you could rely upon to remain the same, in kind and in degree, for all sorts of consciousnesses. The result of psychological observation would thus be subject to error, but to what is technically known as a constant error; and there is nothing fatal to science in that; what science fears is the variable error, an error that changes from one observation to another, or from moment to moment of the same continued observation.[53]

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[49] *Ibid.*, i, 444 f.

[50] *Ibid.*, ii, 221: "Eine Steigerung des Bewusstheitsgrades der Akte des Selbstbewusstseins, die von jedem Erlebnis produktiv angeregt werden."

[51] K. Marbe, review of E. Dürr, Erkenntnistheorie, *Zeits. f. Psychol.*, lx, 1911, 115, 121.

[52] I. Kant, *Metaphysische Anfangsgründe der Naturwissenschaft*, 1786, x. f. Cf. J. B. Meyer, *Kant's Psychologie*, 1870, 207 ff.

[53] I do not here discuss the more usual reply to the objection,—the reply that introspection is, in strictness, retrospection.

It is, however, needless thus to face a difficulty until one is sure that the difficulty exists. What are the facts about introspection, as the method is employed in current experimental work? Is introspection necessarily a conscious process?

Long before the days of the *Aufgabe*-psychology, Wundt had answered this question in the negative. Wundt, it will be remembered, affirms that experiment not only safeguards introspection, but actually makes introspection, as a scientific method, possible.[54] Here, then, is his reply to Kant. "The objection overlooks the enormous influence exerted, in these as in all observations, by the mechanism of habit, by the practice which results from the frequent repetition of similar observations. *In his attention to the phenomena under observation,* the observer in psychology, no less than the observer in physics, *completely forgets to give subjective attention to the state of observing.* So long as this state is felt to be unnatural and itself incites to reflection, so long, of course, observations in both sciences are unreliable; and it is therefore obvious that, in both fields, the special subjective art of experimental observation, as well as the external technical procedure, must be learned and practised."[55] Nowadays, of course, we should supplement this account by a reference to the 'purpose' to introspect and its gradual lapse from a psychophysical to a physiological status.[56] But our reply to the general question would be the same: introspection, in the ordinary course of psychological investigation, is not as such a conscious process.

We have, in fact, but very scanty knowledge of the experiences in which introspection as a conscious process does take part. The introspective exercises set to the beginner, in laboratory drill-courses, are of an extremely simple kind; and the *bona fide* beginner does not bother about the 'state of observing.' The only cases of such concern that I remember, from all my years of teaching, were furnished by relatively mature students of philosophy who, for one reason or another, desired an elementary laboratory training, and who brought to their work a sophisticated interest. Nothing can be made of such students until the teacher has won their goodwill; and when that has been gained, they are ready to follow instructions, and to forget themselves in the experiment. On the other hand, the reports of research-work usually pass over, with mere mention, the preliminary experiments of the period of practice; the observers, as we know them, are already trained; the 'state of observing' has already been mechanised.

We have, it is true, a number of recorded instances in which intro-

[54] E. g., *Phil. Studien*, iv, 1888, 303; cf. note 8, above.

[55] W. Wundt, *Logik*, ii, 2, 1895, 175 f. Italics are mine.

[56] I have discussed, in my *Thought-processes*, the effect of a 'purpose to introspect' and the more general question of the lapse of the *Aufgabe* from consciousness. Müller's detailed study of the *Selbstbeobachtungsabsicht* (*op. cit.*, 72 ff.) will be reviewed in another paper.

spection 'during the course of the observation' has interfered with an experiment. Usually, however, the interference is due, not to the irruption into consciousness of introspection itself, but simply to the premature arrest of the observation at some point which has surprised or interested the observer, or to which his attention has been directed by the phrasing of the instruction. Ach tells us of observers who, from misunderstanding of instruction in the simple reaction experiment, concentrated upon the strain-sensations of the fore-period, and thus, to all intents, broke off the experiment in what should have been its initial stage.[57] More to the point, perhaps, is another remark of Ach's. "Observer H was led, by the questions put to him, to observe his attitude (*Verhalten*) on the apperception of the stimulus in the main-period; he was thereby thrown into a state of confusion, which influenced unfavorably the further course of the process."[58] If 'attitude' here means 'state of observing' we have, in this case, the appearance of introspection as a conscious process, though we are not informed as to its nature or composition. Such cases, Ach says, were rare.

I had thought that light might be thrown upon introspection, as an occasionally conscious process, by the recent studies of the acquisition of motor skill, in which the process of learning is set forth from its beginning. If, however, these studies contain relevant observations, I have unfortunately missed them. Book, for instance, writes: "A well-known difficulty encountered in getting reliable introspective data is to keep consciousness from concerning itself with the observing act. This was met in the present experiment by having each learner take care always to write at a maximum rate and without thinking of how the work was done or of how attention was working."[59]

### 6. *Non-introspective Characterisations of Mind*

It is a fact obvious enough, but sometimes lost sight of, that a characterisation of mind need not, just because it characterises a 'mental state,' therefore be introspective. Introspection approaches mind from the special standpoint of descriptive psychology. But mind is approached from many other standpoints: from that of moralising common-sense, from that of philosophical reflection, from that of biology, from that of everyday converse. In strictness, no one of these standpoints is capable of furnishing introspective data: introspection demands, if systematic, the carefully planned observations and the trained observers of the psychological laboratory and, if casual, an ingrained habit of observation that has been moulded in the laboratory.[60]

I am aware, of course, that the non-introspective attitudes

[57] N Ach, *Ueber die Willenstätigkeit und das Denken*, 1905, 37; cf. *Thought-processes*, 238 f. Cases of this sort are, I imagine, familiar to all investigators of the 'higher' intellectual processes.

[58] *Ibid.*, 22. Cf. Müller, *op. cit.*, 74.

[59] W. F. Book, *The Psychology of Skill, with Special Reference to its Acquisition in Typewriting*, 1908, 17.

[60] I do not forget the questionary and the mass-experiment. But these, to be of value, must be very simple exercises in introspection, planned and tested by the trained psychologist. And I doubt if, at the best, their value is more than confirmatory. Cf. Müller, *op. cit.*, 146.

to mind do, oftentimes, furnish suggestion, and even material, that may be of high value to the descriptive psychologist. There are two reasons: that they are attitudes familiar to the psychologist in his own experience, and therefore comparable or interchangeable with the other attitude, of introspection; and that their determination, as traditional or historical attitudes, may be of a mixed or, to speak more accurately, of an undifferentiated nature, and may therefore contain the primule of what, at a later stage of development, is a truly psychological 'set.' But these facts do not affect the general statement.

I quote once more from Stout. "There is no fallacy, obscurity or ambiguity in the statement that when I have toothache I dislike it very much, or that I was afraid when I saw a white figure in the churchyard. There is no fallacy or ambiguity in the statement that feeling pleased is different from feeling displeased, or that when we are fully convinced that an action is totally impossible, we cannot voluntarily determine to perform it. Facts of this kind can be observed with ease and certainty by everyone. Now if introspection could only supply us with such simple and obvious data, it would none the less be of essential value. It would supply us with the general terms in which to describe mental process."[61] I cannot imagine anybody but a professional psychologist declaring that 'feeling pleased is different from feeling displeased.' As for the other instances: I can well imagine a man's saying "The one pain I can't stand is toothache," or "I must confess that I am still afraid of ghosts,"—and I can well imagine a prolonged argument on the question whether one can ever decide to do what one knows to be impossible,—without the remotest reference or the slightest appeal to introspection.

Thorndike, again, in a rough list of the 'mental facts' which form the subject-matter of psychology, mentions "ideas, opinions, memories, hopes, fears, pleasures, pains, smells, tastes, and so on."[62] But what are 'opinions' doing in that galley? In what sense is an 'opinion' to be included in a "list of states of mind?" There is a psychology of opinion, as there is a psychology of assumption, of working hypothesis, of belief; but the opinion as opinion is not material for psychology. One wonders, indeed, whether the presence of this term will not lead the reader to misinterpret the rest. In phrases like "I acted upon the idea that he was not in earnest," "memories of a long life," "he never lost the hope of educating himself,"—in phrases like these, the words 'idea' and 'memories' and 'hope' are not psychological; and yet it is in such meanings that they go best with the word 'opinion.' For further discussion of this point, in a special case, I refer to the paper entitled *Description vs. Statement of Meaning*, published in the last number of the JOURNAL.

On the other hand, the pragmatic attitude of daily life may, on occasion, be identical with the introspective attitude of the psychologist. Müller instances the layman, suddenly made aware by a 'psychological apperception' that his visual memory-image of a colored object is itself colorless.[63] We all know of similar cases. A child of six once asked me how it was that, if you shut your eyes, you could see pictures of

[61] *Op. cit.*, 16 f.
[62] E. L. Thorndike, *The Elements of Psychology*, 1905, 1.
[63] *Op. cit.*, i, 1911, 70; cf. 105.

things that were not there. The same child at nine betrayed by a casual remark that she, and her elder sister of eleven, possessed and had discussed number-forms. A chance conversation at a dinner table brought out the fact that some of the company saw colors, and some saw only greys, in their dream scenes. Anecdotes of mental peculiarity find their way into print, and may form the starting-point of studies like Galton's enquiry into mental imagery.[44] The psychologist will, indeed, always be quick to take advantage of observations of this kind, when they come his way; he will question and compare, and may perhaps be drawn into a serious investigation. It is clear, however, that the occasional introspection is of value to psychology only if the psychologist is there to pick it up.

The training of which I have spoken, as necessary to a systematic introspection, is essentially the same as the training necessary to reliable observation in physics or biology. There is nothing mysterious or esoteric about the introspective method. If there are differences in introspective ability, so also are there differences in mathematical, musical, linguistic ability,—in theoretical and practical ability of every kind. A high degree of native ability may shorten the period of apprenticeship; but our most gifted musicians, our ablest engineers, must still be trained: and, conversely, a very slender ability may be brought, by a well-directed course of training, to very respectable performance. Introspection is a technical method, and is best learned in a technical school; like other technical methods, it is best learned while the learner is still young; it is, however, a method which any normal person, coming to the task with goodwill and application, may understand and acquire.

The undergraduate, no doubt, finds introspection difficult. When he is called upon to observe the negative after-image, or to describe his sensations of cutaneous warmth and cold, he is likely to draw an unfavorable comparison between psychology and physics; the objects of psychological observation 'can't be got hold of,' are—in his immature vocabulary—'vague' and 'abstract.' The difficulty is real; we have all suffered from the elusiveness, the intangibleness, of mental processes. We seek to reassure the beginner by pointing out that elusiveness and intangibleness are, after all, relative terms, and that practice will do for him what it has done for others before him. At this stage of his training we can hardly say more. In fact, however, the difficulty goes deeper: for the break with common sense is made earlier and more definitely in psychology than it is, perhaps, in any other science. The student of physics or chemistry or biology may hold, for some little time, to his common-sense attitude; the materials with which he has to deal are still, in large measure, the 'things' of everyday life; his experiments and formulas have a familiar setting. Psychology, on the other hand, enjoins a new attitude to mind; unlearning begins with learning; the laboratory offers an immediate challenge to tradition and opinion. From the pedagogical point of view, psychology is here at a disadvantage,—though it may be questioned whether the disadvantage at the start is not offset by advantage for the future; whether the student of physics or biology, when he comes to physicise or biologise the whole of experience, is not handicapped by his youthful alliance with common sense; whether the student of psychology does not gain, in the long run, by the greater severity of his early discipline. Be this as it may, the difficulty which the beginner feels is, in so far, a difficulty which he is unable to express, and which—if formulated for him—he is unable in any intimate way to understand. It should not be mini-

[44] F. Galton, *Inquiries into Human Faculty*, 1883, 83.

mised: it should not, either, be misinterpreted. Scientific method is a genus with many species; and training in the method of any one science is only specifically different from training in the method of any other.

### 7. *What May We Ask of Introspection?*

Introspection can never give us a system of psychology. The 'pure' psychology of the middle nineteenth-century was, as we have seen, systematised by metaphysics; and modern systems, in order to be systematic, inevitably appeal to something—to the unconscious, to the nervous system, to laws of mental growth and mental organisation—which is not discoverable by introspection. How, indeed, should a method, of itself, yield a science? Introspection is psychological observation; and observation is a way of getting facts, 'observations' in the passive sense, data, materials of science. I hope to discuss, in a later paper, the nature and the range of the facts which introspection reveals: that is a question by itself. Meanwhile, "introspection, viz., the observing and dissecting of experience, is quite like observing the things of sense; there is no more virtue in it, but also no less. It is not for introspection to make explanations, but to discern particular facts." [65]

A good deal of misunderstanding is due, simply and solely, to the ambiguities of language. What, for instance, does a writer mean by 'psychological methods'? He may mean the specific methods which the psychologist, in his capacity and by his training as psychologist, employs in his psychologising: methods, therefore, which have not been acquired by the physicist and physiologist. Or he may mean methods which the systematising psychologist employs in the construction of a rounded science of psychology: methods, therefore, which—so far as they are not specifically psychological in the sense just indicated—are common to all systematisers of science. When Wundt says: "All psychology rests upon introspection," [66] he is thinking of the former meaning of psychological method; when Ladd says: "To observation, direct and indirect, and to analysis by introspection, reflection, and experiment, we add induction as the necessary method of psychological science," and when to observation, analysis and induction he further adds the "genetic method," [67] it is obvious, without the telling, that he has in mind the systematic presentation of mental life, the psychological treatise. What, again, is meant

[65] W. Mitchell, *Structure and Growth of the Mind*, 1907, 423. Cf. my *Text-book of Psychol.*, 1910, 38 ff.
[66] W. Wundt, *Logik*, ii, 2, 1895, 170.
[67] G. T. Ladd, *Psychology, Descriptive and Explanatory*, 1894, 24 f.

by 'introspective psychology'? The words may mean 'a system of psychology which contains (or consists of) only what is furnished by introspection,'—that is, they may be interpreted to make nonsense. Or they may mean 'a system of psychology in which introspection is regarded as the sole, peculiarly psychological method'; in this sense they cover such a system as is set forth in Wundt's *Physiologische Psychologie* and *Völkerpsychologie*,—cover, for that matter, practically all our current systems. Or again they may mean 'psychology in so far as it is introspective,' 'that body of psychological materials which is furnished by introspection,' and thus may carry no reference at all to a psychological system. But suppose that the phrase is used in this third sense, and is read in the first: then a misunderstanding has arisen, from purely verbal suggestion, before there has been opportunity for mutual explanation.

The limits of introspection, on the side of system-making, have often been pointed out; Möbius' discussion may be taken as typical. Dodge is, however, mistaken in his belief that Möbius teaches "the fallaciousness of all introspection and the consequent hopelessness of all empirical psychology."[88] Möbius does not underestimate the difficulties of introspection; but he nowhere calls it fallacious. Psychology is hopeless because "the psychologist has absolutely nothing more than introspection and the argument from analogy;" and as these are inadequate to a science, "psychology must cross the borderline of empiricism and reach a hand to metaphysics."[89] I agree with Möbius and Dodge that introspection cannot make a science; I agree with Dodge, and disagree with Möbius, in thinking that we can achieve a science of empirical psychology.

*Summary.*—The method of introspection is still generally regarded as the most important means of psychological knowledge. The introspection of the laboratory must, however, be distinguished from that either of a moralising common sense or of a rationalising philosophy. In its scientific form the method is its own test; contradictory results mean an imperfect control of the conditions of observation.

Introspection implies self-consciousness only in the sense and to the degree in which all scientific observation implies self-consciousness. And its employment need not be conscious; for time and experience reduce it to a habit.

Introspection presupposes a particular scientific standpoint, that of descriptive psychology. It is not, however, adequate of itself to furnish a psychological system; like other scientific methods, it supplies materials which, by the aid of explanatory principles, may be worked up into a system.

[88] *Op. cit.*, 214.
[89] *Op. cit.*, 13, 14, 51 f., 68.

# DESCRIPTION OF A ROTARY CAMPIMETER

By C. E. FERREE, Bryn Mawr College

The object of this apparatus is to add to the vertical campimeter the rotary features of the perimeter, and thus to allow investigation of every possible meridian of the retina with as much ease and precision as was possible with the old form of campimeter in the nasal meridian only, or at most, in the nasal and temporal meridians. The apparatus consists of two parts, with appropriate supports and accessories; a stimulus screen, and a campimeter screen which rotates on a collar around a circular support. The stimulus is exposed through an opening in the center of the campimeter screen. One arm of the framework of this screen carries the fixation-points and also a right-angled extension which allows fixation to be given at an excentricity of 92°. This arm may be rotated to any position desired; and thus any meridian of the retina may be explored. In order that the sensation received in the peripheral retina may be accurately expressed in terms of color- and brightness-values of the central retina, the fixation-arm of the screen is further provided with a small detachable motor upon which may be rotated the proper combination of discs for matching the peripheral sensation. This increases greatly the definiteness of work on the sensitivity of the peripheral retina. The feature was added to the apparatus so that complete maps might be made of the changes in the sensitivity of the retina from center to periphery and from one meridian to another, with tables showing the value of the changes from point to point.

Photographs of the skeleton apparatus and of the front and back views of the campimeter, in readiness for use, are appended.

Figure 1 shows the skeleton apparatus. It consists of the following parts: Supporting base, frame for campimeter screen, and frame for the stimulus card. The supporting base consists of a horizontal steel bar, 83 cm. long, supported by two iron tripod rests (B and B′). To this bar are clamped two uprights (C and C′), which are adjustable along its length. The anterior upright (C) supports the frame on which the background of cardboard and the campimeter screen (D) are fastened. The posterior upright (C′) supports the stimulus frame (E). The height from

the table of each of these frameworks is adjustable by means of set-screws (F and F′). The framework for the campimeter screen consists of a central support and radiating arms. The central support consists of a stationary brass ring, about which rotates a larger brass collar (H), 20 cm. in diameter.[1]

The back surface of collar (H) is graduated from 0° to 360°. To this collar are fastened the radiating arms. There are eight of these arms, one for each 45° mark of the graduated collar. They are made of steel and are 2 cm. broad and 40 cm. long. The eighth arm (I and I′) differs from the other seven. It forms a right angle, one side of which lies in the plane of the background, and the other in front of this plane. The part in the plane of the background is 30 cm. long, and the part at right angles to this plane is 28 cm. long. The arm is graduated from 18° to 57° along the section that lies in the plane of the background and from 57° to 92° along the section at right angles. The graduations are based on the arc of a circle of 25 cm. radius. The arm is also split lengthwise to form two narrow arms, each 1 cm. wide, so separated that there is an opening (J) 0.8 cm. in width between them to admit the shank of the motor for rotating the discs needed to match the peripheral sensation. The opening to admit the shank of the motor may be clearly seen in all the pictures of the campimeter. The motor is shown at K, on the right of Figure 1, and more clearly on the left of Figure 3. It has a shank 4 cm. long, and 0.3 cm. in diameter, which can readily be thrust through the opening (J). The weight of the motor is so great that it can not be clamped to the arm (I-I′) and be shifted with the arm as the retina is tested in different meridians. It has then to be supported so that it can readily and quickly be moved to any point in any meridian to which the arm (I-I′) may be rotated. This is accomplished by the use of two rods—one vertical and the other horizontal (M). The vertical rod (L) may be clamped to the table

[1] This ring was made large in diameter for two reasons. (a) The ring had to be made very thick in order to give sufficient rigidity to support the campimeter screen and to furnish proper attachment for the rotary collar. Had the circumference been small, the effect of the ring would have been that of a short tube. If the stimulus were viewed through a short tube, an induction factor would have been involved which would have been difficult, if not impossible, to standardize. The opening in the ring was, therefore, made considerably larger than any stimulus we wished to use in order to avoid the introduction of this factor. (b) The large circumference of the ring makes the apparatus available for investigating the effect upon sensitivity of varying the size of the stimulus.

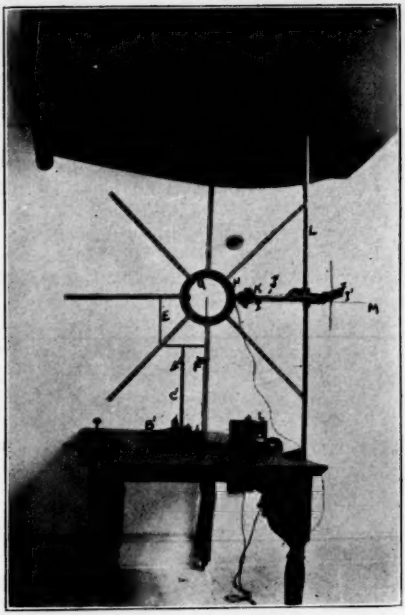

FIG. I.

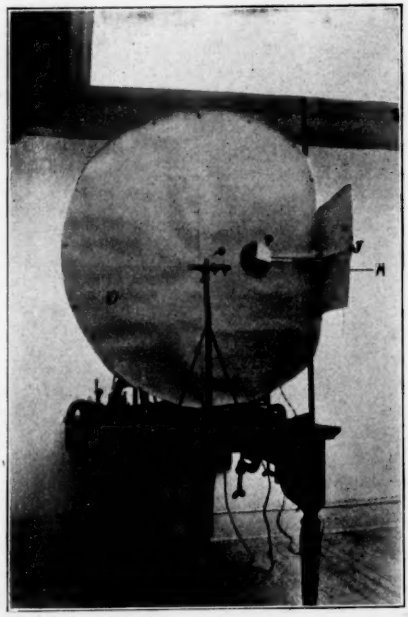

FIG. II.

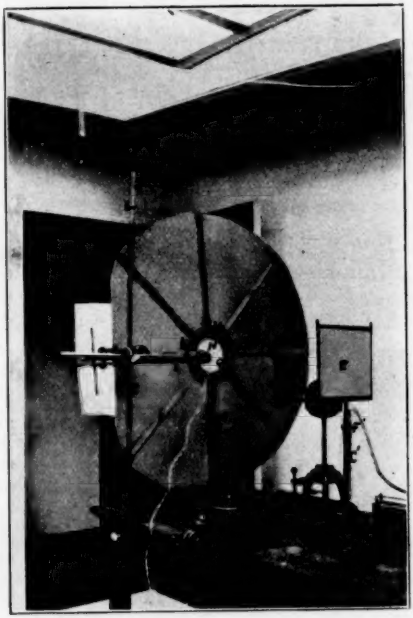

FIG. III.

or other support on either side of the campimeter, and M is clamped to L. The vertical adjustment for any setting of the motor can thus be made along L, and the horizontal adjustment along M. Holes are punched in each of the eight arms at six or more places to allow the insertion of small metal fasteners to hold the background screen to the frame. The stimulus frame may be seen at E. It is 20 cm. square and carries a groove for the insertion of the stimulus card. The stimulus card may be made of whatever colored paper the experimenter desires to use.

Figure 2 shows the front view of the campimeter in readiness for use, and Figure 3, the back view. A card-board background has been fastened to the steel arms by means of paper fasteners. Since the background is fastened to the arms attached to the brass collar (H), a circular gap is left at its center. This gap is filled by a disc (N), shown in Figure 3, which has been fastened to the arms just outside of the collar (H). The disc is 27 cm. in diameter, and contains the stimulus opening (O), the size of which may be varied to accord with the purpose of the investigation. In order to complete the graduations on the fixation-arm to the stimulus opening, disc (N) is graduated from 0° to 18°. A background 40 cm. in height is fastened to the extension arm (I). In the picture a paper screen made of No. 7 of the Hering series of grays has been attached by thumb tacks to the card-board background.[2] A strip of paper of the same quality as the background is placed along the opening (J), and the graduations from 0° to 92° are pricked on this strip at points determined by the markings on the back of disc (N) and arm (I-I′). These constitute the fixation points. The card in the stimulus frame (E) is seen through the opening (O). A disc (P) composed of black and white sectors has been placed on the motor (K).

The method of using this apparatus is as follows: The observer is seated in front of the campimeter-screen with his head held in a rigid position by means of a mouth-board bearing the impression of the teeth in sealing wax. Since the graduations of the fixation-arm are based on the arc of a circle of 25 cm. radius, the distance of the eye from the stimulus opening is chosen as 25 cm. The position

[2] In all tests of the relative and absolute sensitivity of the retina this screen should be made of a gray of the brightness of the color to be used. No departure from this rule should be permitted unless it is for the purpose of determining the effect of different screens on the sensitivity of the retina, or of using this effect as a means of varying sensitivity.

of the eye in the observing plane may be obtained according to the method described by Fernald.* In order to facilitate eccentric fixation in the nasal and temporal meridians, the head should be turned 45° nasalwards or temporalwards, as the case may be. With the head so placed, the eye can swing easily from the stimulus opening to a fixation-point whose eccentricity exceeds 90°. The unused eye is closed and covered by a bandage. The arm (I-I′) is placed in the meridian desired, the position being determined by the graduations on the collar (H). The experimenter covers the stimulus in the stimulus frame with a card, which we shall call the pre-exposure card,[3] while the observer takes the fixation required. At a signal given by the observer, the pre-exposure card is withdrawn, the stimulus is exposed for three seconds, and the pre-exposure card is replaced over the stimulus. The observer is required to rest the eye after each observation. Further provisions against fatigue are made by periods of rest after each fifteen minutes of observation.

When it is desired to measure the stimulus as seen in the peripheral retina in terms of the brightness- and color-values of the central retina, the motor shown at K in Figures 1 and 3 is used. The method of making the measurement is as follows: If a direct vision judgment, for example, of the appearance of yellow at 25° in the temporal meridian is wanted, the cord (R) carrying a movable fixation-point, seen in Figure 2, is fastened in front of the 25° point on the graduated background. The observer, in position, fixates the 25° point and brings the movable point in line with the eye and the 25° point. This point then serves as the new fixation-point, and the graduated strip covering the opening (J) is removed. The required discs are placed on the motor immediately behind the new fixation-point, and their proportions are changed until the observer judges that the sensation aroused in the periphery is matched by that aroused in the center by the measuring-disc on the motor. In making this judgment, the method of ascending and descending series should be used.

This apparatus was designed two years ago. The object at that time was, in general, to make an exhaustive study of retinal sensitivity to colored light in a large number of

* FERNALD, G. M.: The Effect of Achromatic Conditions on the Color Phenomena of Peripheral Vision. *Psychol. Rev., Monograph Supplements,* X, 1909, p. 18.

[3] In all investigations of relative or absolute sensitivity, this pre-exposure card also should be made of a gray of the brightness of the color to be used.

meridians. Early in this work, however, the need for more adequate standardization was recognized. The problem of standardizing was divided into two parts: the source of light, and the factors extraneous to the source of light. The apparatus described above was designed especially for the standardization of the factors extraneous to the source of light. Pigment papers were used in this work as a source of light because they are fully adequate to the needs of the problem, and are besides much more convenient than spectral light for many of its details. The apparatus was thus especially devised for the use of pigment papers. About nine months ago, however, the standardization of the source of light was begun. This required, on the qualitative side, that light of spectral purity be used; and on the quantitative side, that the lights be measured in terms of units that can be compared, i. e., in terms of energy or radiometric units. The apparatus has been remodeled and supplemented to meet these needs. A description of the revised apparatus together with the supplement for radiometric measurements will be given in a later paper.

# A REMARK ON THE LEGIBILITY OF PRINTED TYPES

By F. M. URBAN

Miss B. E. Roethlein published in the January number of this JOURNAL an account of a very interesting investigation on the relative legibility of different faces of printing types. At the end of the paper she discusses the influence of the quality and texture of paper, and mentions the suggestion of Babbage that slightly yellowish paper be used in the manufacturing of books. She remarks that, from the data available in the literature, it is impossible to decide whether this suggestion is of real value or not.

It does not seem that this idea was intended for ordinary books which are read in the customary way, but for reference books only which, like tables of logarithms, must be consulted a great many times and where the information required must be picked out from a great number of similar data. It seems that Babbage's idea has stood the test of experience and is now past the experimental stage. The geographical survey of the French army (*Service géographique de l'armée*) publishes logarithm tables which make use of Babbage's suggestion. All these tables are printed on colored paper which is absolutely dull, so as to avoid the glare of reflected light. The tables which are most frequently used are printed on slightly yellowish paper; and only the tables of the trigonometric functions in the hexagesimal division of the circle are printed on blue paper, in order to make these tables easily recognizable. The success of this plan is indisputable. The first edition of the tables with five places was soon exhausted; a new edition had to be issued in 1906, which except for the elimination of a few misprints is an exact reproduction of the first.

These tables are superior in many respects to the ordinary tables, so that one cannot attribute their success to any particular feature. The fact, however, that the colored paper is used in both editions suggests that this innovation has proved to be useful. Anybody who is sufficiently interested can easily verify the superiority of the tables of the French survey by the following experiment. Use these tables the first evening for from two to three hours, and on the following evening repeat the calculations with any other logarithm table. The mental strain and the fatigue of the eyes will be considerably greater in the second case. I called the attention of several of my friends to these tables and they all agreed as to their superiority—a testimonial which found its realistic expression in the purchase of a copy of the book by those who have to use logarithms a good deal.

I should like to call the attention of the experimentalists to the fact that numerical tables offer several interesting psychological problems. I will mention in this place only some of the more obvious ones. The ordinary table of logarithms contains ten numbers on each line; and from this group of ten numbers one has to choose the right one.

This process is not a simple one, because the eye has difficulty in following the line accurately. Most people aid the eye by indicating this movement with the finger and stopping at the right place. The above mentioned tables of the French survey eliminate this difficulty by printing the logarithms directly alongside the corresponding numbers. This makes the tables somewhat longer; but it facilitates the work of the computer in a very high degree.

It seems that this difficulty of keeping the eye on the same line depends on two factors, the amount of space between the lines and the number of lines which are grouped together. The ordinary tables group the lines in sets of ten.—the groups being separated either by a wider space or by a bar. Groups of ten are entirely too large and it seems advisable to split them up into groups of three lines separated by wider spaces, and to put the tenth line between two solid black bars. This is, for instance, the arrangement of Bruns's table of the probability integral. While working with these tables one need not use one's finger to indicate the correct entry; and mistakes are very rare. The increase in the size of the tables is inconsiderable, amounting to only a few lines per page.

It ought to be possible to get some experimental material showing the best arrangement for tables of this kind. This could very well be done with an apparatus similar to the one employed by Miss Roethlein, adapted in such a way as to investigate the influence of the spacing of the same type. Mistakes are rare if the lines are very far apart; but they seem to become more frequent with decrease of the space between the lines. It is, therefore, a legitimate question to ask, what is the minimal space between the lines which is compatible with accurate reading. Such results might save unnecessary expense in printing; and—what is perhaps more important—they would save time and energy in computing. Numerical calculations are carried on all over the world on an ever-increasing scale; and any slight saving of time has a very definite value in dollars and cents.

Another important point to consider is the amount of fatigue produced by different types and by different spacings. The energy and the eyesight of the calculator are assets which must not be trifled with. The compilers of many of the logarithm tables which are on the market apparently did not take this fact into consideration at all. The figures are printed on glossy paper as close together as possible, thereby producing on the eye a most disagreeable effect.

These questions have to do with a problem in optics, which can be approached by straightforward methods. My next observation refers to the psychology of memory. In selecting logarithms from a table, or in consulting any other numerical table, one has to remember the figures while putting them down on paper. My observation is that I can take in five or six figures almost at a glance, and remember them accurately for the short time necessary to write them down. It requires a decided effort for me to read a seven-place logarithm at a single glance; and in copying any number which contains more than seven figures I usually divide it into groups of convenient size. This certainly is not entirely due to lack of practice on my part, because several professional computers, whom I had a chance to interview on this topic, seemed to agree that six or seven figures is just about the limit which can be taken in at once. Only one of my friends seems to be able to select a ten-place logarithm from a table at a single glance; but he is gifted with an unusually good memory, as is also shown by his achievements as a blindfolded chessplayer. It seems that this fact is intimately connected

with the problem of the *Umfang des Bewusstseins,* and might be investigated by the same methods which have been employed in that topic.

My next and last observation refers to a much more complicated psychological problem and is directly suggested by the above-mentioned French tables. It is customary to divide the circle into quadrants of ninety degrees each,—a custom which we inherit from the Babylonians, if one may believe our historians. This hexagesimal system has many inconveniences due to the fact that it does not use our decimal system of numbers. In order to avoid them, Delambre divided the right angle in 100 degrees and calculated tables of the trigonometric functions for this new division of the circle. This division is also adopted in the new tables of the *Service géographique de l'armée;* and any one may readily see from these tables that the centesimal division of the circle is by far superior to the old system. All the calculations are much simpler and afford fewer chances for mistakes.

The centesimal division of the circle is—or at least ought to be—universally known by the profession; and it is a surprising fact that the innovation has not yet received unanimous sanction. It certainly is just as simple to teach that the right angle contains one hundred degrees as that it contains ninety degrees. There are no material interests at stake, because the instruments for measuring angles may still be used so long as they are accurate, since it is an easy matter to transform the old readings into the new system. One involuntarily thinks of the obstacles which the introduction of the metric system has encountered, although the case is slightly different here. People naturally cling to customs and institutions which they regard as characteristic of their country; and a change in the system of weights and measures necessitates a certain initial outlay which is perhaps not quite inconsiderable. No such reasons can be urged against the introduction of the new division of the circle; but it seems that every new idea has to overcome a certain resistance before its true value is recognised. The arguments brought forward in defense of the old system are very likely of small intrinsic value; but they are certainly of interest to the psychologist, and their study would make an interesting chapter of *Völkerspychologie.*

# A LIST OF THE WRITINGS OF JAMES WARD

By. E. B. TITCHENER and W. S. FOSTER

For aid in the preparation of this bibliography we are indebted, in the first instance, to Professor Ward himself; without his assistance we should have sinned grievously, both by omission and by commission. Our thanks are also due to Dr. L. N. Wilson, Librarian of Clark University, and to Professor R. M. Yerkes of Harvard University.

1874

(1) *Animal Locomotion.* Nature, ix., 381-2, March 29, 1874.
(2) *Animal Locomotion.* Nature, ix., 440, April 9, 1874.

1875

(1) *The Relation of Physiology to Psychology: an Essay.* 8vo. pp. 63. (Privately printed.)

1876

(1) *An Attempt to Interpret Fechner's Law.* Mind, [O. S.] i., 452-466. (Part of a privately published Fellowship Dissertation, written in 1875.)

1879

(1) *Observations on the Physiology of the Nervous System of the Crayfish.* Proceedings of the Royal Society of London, xxviii., no. 194, March 6, 1879, 379-383. Communicated by M. Foster. Received Feb. 17, 1879. (Summary of the following paper.)
(2) *Some Notes on the Physiology of the Nervous System of the Freshwater Crayfish* (Astacus fluviatilis). Journal of Physiology, ii., 214-227.
(3) *Vitality of the Common Snail.* Nature, xx., 363, August 14, 1879.

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(2) *Psychological Principles. II. Fundamental Facts and Conceptions.* *Mind,* [O. S.] viii., 465-486. (For III. see 1887.)
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(1) *Herbart.* Encyclopaedia Britannica, 11th ed., xiii., 335-338.
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# THE DISCRIMINATION OF ARTICULATE SOUNDS BY CATS

By W. T. SHEPHERD, Ph.D.

This paper is a report of experiments which were made with cats to determine their ability to discriminate articulate sounds. If an animal forms an association between a certain name and food, so that he reacts in a definite manner to that name in order to obtain food, and does not so react when other names are called, we may say he discriminates that name from the other words. The major part of the routine work of the experiments to be reported was done by my wife, Mrs. Barbara Shepherd.

It is commonly believed that the higher mammals can be taught to respond to their names, or to express it more accurately, to discriminate articulate sounds and to make appropriate motor responses thereto. It is well known that dogs, horses and other domesticated animals learn to respond to their given names; but it is not known, from well-conducted experiments, whether there is in these cases a discrimination of quality, loudness, or of time of the sound. The results that have been obtained with animals under experimental conditions have been few, and in some cases the differentiation of tone and intensity has not been made. Thorndike, it will be remembered, found that cats were apparently able to discriminate sounds made by him, though not with a great degree of delicacy.[1] The sounds that Thorndike used were quite complex in character, such as, "I must feed those cats" and "My name is Thorndike." In his work on the functions of the temporal lobes Kalisher reported[2] having been able to get dogs to discriminate sounds made by an harmonium, but he was more interested in producing the association for the purpose of determining (after extirpation of different parts of the cerebral cortex) the cortical centers for sound perception than ability in his animals to discriminate sounds. Selionyi,[3] using a form of the 'Pawlow method' on dogs, has also obtained evidence of discrimination by them of the tones of an organ, of organ pipes and of two whistles. He also was chiefly interested in sound discrimination from a physiological standpoint. In experiments on auditory discrimination in raccoons by the present writer in 1906, reported by Cole,[4] evidence of pitch discrimination by those animals was obtained. In experiments on auditory discrimination in Rhesus monkeys which I made in 1909, evidence of discrimination of pitch and also of discrimination of 'noise' was obtained.[5] In tests made by the present writer on raccoons for the discrimination of articulate sounds,[6] similar

[1] THORNDIKE, Animal Intelligence, 1898, 129 ff.

[2] KALISHER, Eine neue Hörprüfungsmethode bei Hunden, *Sitz. d. Kgl. Ak. d. Wiss.* X. 1907, 204 ff.

[3] SELIONYI, G. P., Contributions to the Study of the Reactions of the Dog to Auditory Stimuli. St. Petersburg, 1907.

[4] COLE, Concerning the Intelligence of Raccoons, *Jour. Comp. Neur. and Psychol.* XVII. 236.

[5] SHEPHERD, Some Mental Processes of the Rhesus Monkey, *Psychol. Rev. Mon. Sup.* No. 52, 1910, 26 ff.

[6] SHEPHERD, The Discrimination of Articulate Sounds by Raccoons, *Amer. Jour. Psychol.* XXII, 1911, 116 ff.

to the tests herein presented, satisfactory evidence of such discrimination was obtained.

At the time the experiments to be reported were begun, one of the animals was seven months old. It had not been called by any especial name, and had not had any previous training in the discrimination of articulate sounds. The animal appeared to be of medium intelligence. The other cat, the mother of the first, was about three years old. The latter animal, previously to these experiments, had been given the name of Widget, and apparently responded to that name. The cat was of average intelligence. Both animals were ordinary grey house cats.

The cat was placed in a cage, 66 centimeters in height. A wire netting formed the front and also the top of the cage. The experimenter sat a distance of about a meter from the front of the cage and called the name given the animal. Ten seconds were allowed the cat, if necessary, in which to give the proper motor response, then, whether or not a response was obtained, the animal was fed. In conjunction with the name given, other words were also called, viz., 'no feed,' and when the latter words were called the cat was not fed. For the first animal the proper response was considered to be obtained if it reared up with the paws on the front of the cage and looked up for food to be given it through the top of the cage. A similar response was required of the second cat in the earlier experiments with it, while in the later ones the required response was changed, as will be hereinafter explained. The name of the animal and 'no feed' were called in an irregular order, so that the response might not be to the mere of the calling of the words. During the experiments, the cats were kept moderately hungry.

*Pet.* On the third day of the experiments, this animal began to show some indication of forming the association: In twenty trials it responded to the name *Pet* nine times, and in twenty trials to the 'no feed' call, it responded three times. The animal continued to improve in the association of its name with the proper reaction, and, on the ninth day, or after 150 trials in all, of 'Pet' and of 'no feed,' it responded to the name 'Pet' nineteen times in twenty trials, and to 'no feed' seven times. On the thirteenth day, or after 250 trials, the cat had perfected the association. In twenty trials it responded to its name twenty times and to 'no feed' two times. In one of its responses to 'no feed' on that day, the cat got down again at once. In four of the trials it got part way up. In both of the latter instances of errors, it appeared, by its looks, to know that it had made a mistake by so responding. Control tests were then made of the animal's ability to discriminate. In the first of these control tests other words were substituted for 'no feed,' as 'box,' 'floor;' but no difference in ability properly to react was noted. As a second control test, the words were called in varying tones of voice, in quite loud tones and in very low tones; but the percentage of proper reactions remained as in the experiments proper. As a third test, the words were called by a different person. Again the responses were strikingly characteristic of discrimination.

*Mary.* The older animal showed no clear indications of forming the proper association until about the tenth day of the experiments with it. On that day it responded to 'Mary' ten times and to 'no feed' six times in twenty trials. After this its progress in forming the association was slow. So slow did it appear in this regard that we attributed its slowness to the rather marked inactivity of the older animal. We

had noticed, however, that when its name was called the cat would look up at the top of the box or at the food lying at the distance of about a meter from the front of the cage. From this hint we changed the response required of this animal to constitute evidence of discrimination. We counted it sufficient indication of such discrimination if the animal looked towards the food when its name was called. Mary's improvement in properly reacting was at once marked. On the second day thereafter in twenty trials the cat gave the appropriate response fifteen times and reacted to the 'no feed' call six times. On the twenty-fifth day's experiment with this animal, it responded to the name Mary nineteen times and to 'no feed' four times. In nine days' further experiments this cat's record continued nearly similar to the twenty-fifth day's trials. The animal never entirely succeeded in inhibiting the tendency to respond to the 'no feed' signal. Similar control tests were employed as had been used in the case of the other animal. The results were approximately the same in percentages of proper reactions as in the experiments proper.

The results of these experiments are clearly positive. It does not appear possible to attribute the reactions of the cats to any other mental process than association of the names given them with the food getting, and the consequent discrimination of the names given them from the other words used. It cannot be objected that the animals received any cue from the experimenter, as we were careful to remain impassive during the trials, and not to give by looks, motions of the hands or body, any cue to the required response, or to allow any perceptible difference of attitude to be exhibited by us when the names Pet and Mary were called and when the other words were articulated. Neither can it be urged that the cats were led by the smell of the food to react to their names. The food was in exactly the same position in relation to the animals when their names were called as it was when we called the other words. Moreover, the three control tests employed in the experiments appear sufficiently to confirm the claim that the discrimination did take place. We conclude, therefore, that cats, or at least some cats, are able to discriminate articulate sounds.

It is of some interest to note that while in these experiments the younger cat formed the association in 250 trials, the older animal required 490 trials to form a similar association. Now, while from the small number of individuals tested in these experiments, we may not infer that younger cats will always, or usually, form an association more quickly than do their older congeners, the above results serve as confirmatory of the view held by many observers in this field that the younger, more active individuals, learn to form certain associations with more facility than do older animals under similar conditions.[7] As compared to the ability of raccoons to discriminate words, as shown by results in similar experiments, the results obtained from the cats in these experiments appear roughly to correspond in rapidity of learning. While four raccoons tested took respectively 270, 375, 425 and 500 trials to perfect the association, the cats respectively took 250 and 490 trials. Here again, because of the few individuals used in these experiments, we are not warranted in drawing a safe inference as to the comparative ability of cats and of raccoons to discriminate words.

[7] The fact that the older animal responded (apparently) to a different name before these experiments began might be a factor which would account in some degree for the different rapidity with which the two cats learned their names in these experiments.

# BOOK REVIEWS

*Le emozioni e la vita del subcosciente.* By G. C. Ferrari. Rivista di psicologia, viii., 1912. 93–118.

In this article Ferrari advances a hypothesis which he refrains from calling a theory because of the uncertainties in the histological and physiological researches on the sympathetic nervous system. The hypothesis, briefly stated, is that the sympathetic or, more broadly, the autonomic nervous system, furnishes the physiological basis for the emotional and unconscious life, as distinguished from the cerebro-spinal system, which is the organ of conscious life. He calls attention to the fact that the introspective researches on thought processes by Marbe, Messer, Binet, Külpe and Bovet have had a beneficial effect in emphasizing the dynamic aspect of thought as opposed to the static discussions, from which we derive our diagrammatic representations, which tend to persist in psychological thinking.

In supporting this hypothesis Ferrari takes James' theory of the emotion as a point of departure. In James' theory that a perception or memory arouses diverse organic reactions as perceived by consciousness, vascular, glandular, muscular, etc., the emotion itself originates from a fact of consciousness, that is, from the cognition which the brain takes of the peripheral modifications. Binet in his last work reaffirmed this emphasis as to the peripheral character of the emotional phenomena, but he added a distinction between the emotion and the consciousness of it. Between an act of intellect and an act of emotion Binet finds a difference only of degree, which is marked by a difference in organic reactions, and for him "an emotion is a mental attitude of an indeterminate nature, in general important and violent." The perception of the organic sensations which accompany the attitude gives the consciousness of the emotion. The emotion exists as soon as the attitude arises, but becomes conscious only when the attitude is perceived. Ferrari notes James' distinction between the grosser or more primitive emotions, such as fear, anger, etc., and the subtler emotions, such as the intellectual, aesthetic, etc., which have not special significance for the conservation of life, and it is the first group which is constantly accompanied by the peripheral modifications which we call emotional expressions, which are traces of movements which in the phyletic series once had a protective value which no longer exists for us. James regards this as showing their vital importance, but Ferrari thinks another interpretation possible, namely that these mimetic expressions still have an effective value and are a direct sign of a correlation which we do not need to interpret.

If this be admitted, then a further inference is logically admissible. We know that these vital emotions are controlled by the same nervous system which controls vegetative life. Now if these manifestations of emotion persist in us, not because of any essential, eventual importance, but because their presence is an epiphenomenon, a fact consensual to the activity of the organs, it is simply necessary to admit that if those organs which exercise a protective function so important to the individual and to the species are innervated by a special nervous system,

and this system has no other functions, to it must be referred those protective functions of which the expression of the emotions is the external index. The physical modifications which constitute the phenomenology of the emotions are dependent upon innervation by fibres of the great sympathetic system, which controls the organic or vegetative life.

In following out the physiological basis of his hypothesis, Ferrari uses chiefly the work of J. N. Langley. Langley divided the autonomic nervous system into three parts, the cranio-cervical, the thoracic-lumbar, and the sacral. The thoracic-lumbar division together with the cords, rami, and thoracic and abdominal ganglia, form the sympathetic nervous system properly so-called, to which must be added the plexuses of Auerbach and Meissner as forming the enteric nervous system. The sympathetic system is thus only a part of the great autonomic system. The German authorities who base their division chiefly upon the fact that all the organs of vegetative life possess a double innervation give the name of sympathetic system only to that part of the ganglia chain of the sympathetic which is connected with the spinal medulla from the first thoracic to the fourth lumbar nerve, while the autonomic nervous system would consist, I, of the cranio-bulbar nervous fibres derived from the basal ganglia and the medulla oblongata, together with the ocular motor, facial, glosso-pharyngeal and vagus nerves, and, II, of the sacral nervous fibres which arise from the inferior lumbar and sacral medulla comprised in the pelvic nerve. In the whole body, the sympathetic system innervates the unstriated muscles of the organs of the blood vessels and the glandular organs. The sweat glands, however, muscles of the skin and head, and a part of the vascular muscles of the intestine, have an exclusively spinal innervation. Some of the autonomic structures have a double nervous supply which may be sympathetic and cranial, or sympathetic and sacral, while other autonomic structures have a single nervous supply, namely from the sympathetic system. Whenever the innervation is a double one, the action of the two systems, the autonomic and the sympathetic, is antagonistic. But there is no constant contrast between the function of the sympathetic fibres on the one hand and the cranial and sacral on the other. In the double supply the fibres from each source may have the same action or they may have a different action, and in the latter case either may be motor or either may be inhibitory. When, however, the fibres of one set arise from several nerves, there is no difference in function in the fibres from the several nerves, which according to Langley gives support to the theory that the cranial and sacral autonomic centers are distinct and developed at a different time and under different conditions.

In support of this theory many biological facts may be quoted. Bethe in experimenting on the most elementary nervous system, that of the Medusa, found that the organs of motility consisted in a circular ring on the margin of the umbrella, which is simply a gelatinous mass of undifferentiated protoplasm, and the tentacles. In these organs are contained very fine neuro-fibrils. Bethe found that if one of the tentacles be touched lightly with a glass rod there is a slight contraction, limited to a portion of the tentacle. If the touch is stronger the whole tentacle contracts, and with increasing force of the stimulus the contraction extends to the whole motor organism, thus showing that this simple nervous structure performs uniformly the two functions of motility and the vegetative life.

Moreover, in observations on the life of insects, and as we ascend the zoölogical scale, we find a dualism and somewhat later an opposi-

tion between the two nervous systems. Fabre observed the *cercer major*, a kind of wasp, prepares for the food of the larvae, which are born after the death of the parent, a large beetle which it paralyzes by its sting. Though the beetle is incapable of movement Fabre found death was only apparent, as no decomposition took place under conditions which would have favored it, and he found the reason for this in the arrangement of the nervous system into ganglia and supposed that there was greater tenacity of life in those ganglia which control the vegetative functions. Ferrari, however, thinks it more logical to suppose that the poison injected by the sting was of a selective nature, which affected only the motor fibres. Thus even as low down in the scale of life as the insects there exists a dualism of the nervous system. An additional proof of this dualism is furnished by the observations of Hirschfeld on embryos and acephalic monsters. In the human embryo the heart begins to beat before there is any general organization of the nervous system, and acephalic monsters have a well developed sympathetic system. Now under the reactions of the sympathetic or autonomic nervous system are included all the movements expressive of emotion while the brain, and consequently our consciousness would only be informed of the existence of the emotions by secondary paths when the global impression of the stimulus and its reaction arrives at the cortex. Observations on the perception of infants and the education of the feeble-minded have shown two successive grades in perception, that is, the simple impression and a preliminary synthesis of associated sensations which takes place before it arrives at the brain.

This hypothesis affords an explanation of the persistence of the mimetic traces in human beings of the emotional reactions of animals and primitive ancestors, for if these are not connected with some process which is continually taking place, their permanence is difficult to explain. If their value was merely that of witnesses to a past stage of evolution, these mimetic traces would occur only aberrantly, casually, like the so-called degenerative signs, instead of being constant and typical.

The instinctive and unreasonable attractions and repulsions which occur in animals under certain circumstances, for example, the tremor of the limbs, perspiration, etc., in horses who have to travel a path which has been crossed by wild animals, also indicates some deep-seated nervous reaction, which is most easily explained as the direct influence of the emotional stimuli upon the sympathetic nervous system. If we take into consideration the importance which these reactions have had in the evolution of different species of animals and man, it is evident that they could never have been safely entrusted to so complex an organ as the brain, which, by the very nature of its function of adapting the organism to new conditions, must have been in an unstable condition in order to render evolution progressive. Moreover, while it may be admitted that many of the internal functions may have originally been presided over by the brain and then relegated to the lower centers, it is not possible to imagine that a function of such importance as the conservation of life was at first performed by the sympathetic system, as is shown by the lower forms of life and acephalic monsters, was then assumed by the brain at some period of which we have no evolutionary traces, and then again became a function of the sympathetic system, whereas we know that this has always provided for the external manifestations of the emotional life. It therefore seems more

logical to conclude that the sympathetic system not only has the function of furnishing modes of emotional reaction but that it has always served completely as the anatomical subtrate of the emotional life.

Another argument based on the emotional reactions is that every one of these reactions, the vaso-motor, glandular, visceral, etc., is based upon the muscular contractions, possibly even on contractions of unstriated muscle. This fact, besides establishing an analogy which is almost an identity, between the simple reflexes of peripheral origin of the autonomic system of Langley and those of our sense organs (for instance, the contraction of the ciliary or rectus muscles of the eye) also furnishes an explanation of the great value and importance of those traces of muscular contractions which the Germans call *Bewusstseinslagen*, now generally called attitudes by French and American psychologists. To the fact that these reactions are a muscular function their preservation has been due. It is being progressively demonstrated that the psychic elements which can find a path in the muscles for the efflux of their energy are those which have the greatest chance of survival and of making their efficacy felt in the consciousness of the individual and upon the fate of the species. A counter-proof also lies in the fact that emotional reflexes become attenuated in man in correlation with the progressive development of the cerebral cortex in which are found the centers of inhibition. That the fundamental facts of emotional life have undergone no essential changes in the course of evolution is too evident to require proofs. But without going back in the animal series for examples, it suffices to note that the same emotions exist in modern man as existed in the Homeric heroes. It is true that we no longer shriek aloud, nor rend our garments and tear our hair at the death of a dear friend, nor do we slaughter the household animals in his honor, because the intellectual sense of the ridiculous admonishes us and restrains these expressions, but the will and the tendencies exist and we feel their power even though the particular expressions are inhibited by the cerebral centers.

A proof of the duality of the two facts, emotions and consciousness of emotions, is found in those cases in which mental disease has caused paralysis of the superior synthesis of consciousness. In support of this Ferrari quotes the case described by D'Allonnes, in which a woman with melancholia, who was anaesthetic over a large portion of her body, showed all the external signs of emotion but declared that she felt none. Binet criticized D'Allonnes' interpretation of this case, claiming that a case completely anaesthetic to all emotion as one observed by Simon would have been apathetic, and maintained that in the D'Allonnes case there was a diminution of emotional consciousness so pronounced in contrast with the conservation of the gestures and words that it merely serves for an argument to insist upon the opposition between emotions and the consciousness of emotions. Ferrari thinks that his hypothesis offers further explanation of this case in that if the sympathetic system is the organ of the emotions and the cerebro-spinal system is the organ for the recognition of emotion, then all the reactions observed by D'Allonnes could take place and the emotion would be present but the patient would fail to recognize it in consequence of the lesions of the cerebro-spinal system, which existed in the case. Other cases of mental disease like progressive paralysis also offer an indirect confirmation of the hypothesis. In these cases there is a degeneration of the blood vessels, especially in the brain, which diminishes or suppresses mobility. The patients are optimistic. Could

not, asks Ferrari, this optimism be due to the rigidity of certain peripheral vascular reflexes, to the constant immobility of the conditions of their cerebral blood supply? In paranoiacs we also have illusions of greatness, but we find a difference in the manifestations of these three classes of cases, melancholiacs, progressive paralytics, and the paranoiacs. In the progressive paralytics there is no conflict between the illusions of greatness and willingness to perform even menial work, but in paranoiacs, although they will perform menial work they must always find some mental justification for it, that is, they must cultivate humbleness, set a good example, etc. Thus in the melancholiacs and paralytics there exists a species of discordance between the nervous systems of the intellectual and emotion life. In paranoiacs, on the contrary, the double personability results from dissociations in consciousness itself determined by the delirium or what provokes the delirium.

Ferrari finds further support for his hypothesis in the facts of gregariousness, both among animals and human beings, and again interest, which is a spring of attention and the controller of association and memory, he considers as the truest expression of those tendencies which do not succeed in sufficiently individualizing themselves to become conscious but determining our emotional disposition, modify and regulate our conduct and give it a form which our intelligence must then justify. It is this intimate and active connection between emotions, obscure, because not yet interpreted to the brain, its principal natural substrate in the nervous system, and the spirit and form of our subconscious activity, which leads Ferrari to maintain that the unconscious activity itself finds its natural foundation in the sympathetic system, which seems peculiarly fitted to be the basis of the unconscious life. It also furnishes an explanation of habit more satisfactory than those usually propounded.

Modern psychotherapy especially in its form of psychoanalysis lays great stress on those residues of impressions which the organism has received and imaged in an epoch in which they could not enter and make a part of the consciousness of the individual because the consciousness of its cerebral centers was still immature, and this also accords well with the hypothesis. Ferrari thinks that while this hypothesis will find its principal confirmation and application in clinical studies upon maladies of the sympathetic, psychology is also able to contribute to its verification. THEODATE L. SMITH.

*Friedrich Nietzsche and his New Gospel.* By EMILY S. HAMBLEN. Boston, R. G. Badger, 1911. 195 p.

This book aims to give an outline of Nietzsche's constructive thought, and to show that this thought is founded on demonstrable biological principles. It finds the essence of Nietzscheism to lie in that absolute monism which applies the law of the conscious process to all the phenomena of life. To admit the truth of this method is to recognize psychology as the "Queen of the Sciences." By this new psychology, the past and its values must be transvalued. History, philosophy and religion, are looked at from this point of view. Nietzsche's social philosophy and his psychology of woman are shown to be inspired by it. The complete symbolic expression of his thought as given in *Thus spake Zarathustra* is touched upon in the last three chapters, entitled respectively, *Zarathustra, Beyond-Man,* and *Eternal Recurrence.*

R. R. GURLEY.

*Die geopsychischen Erscheinungen: Wetter, Kilma und Landschaft in ihrem Einfluss auf das Seelenleben.* By W. HELLPACH. Leipzig, W. Engelmann. 1911. pp. vi., 368. Price Mk. 6.

The author's studies in the psychology of hysteria led him to the idea of a general science of social pathology, which should be grounded upon a social psychology. But social psychology is itself a product of three factors: the anthropopsychical, the factor of psychophysical disposition or of 'race'; the geopsychical, the factor of natural surroundings; and the sociopsychical, the specific contribution of the social life. To understand the third factor, we must be able to eliminate the other two; the study of race and of natural milieu must go hand in hand with the study of society. Partly because geopsychology is the most backward of these three disciplines, and partly because it has an evident practical importance, Dr. Hellpach has prepared the volume before us. He has sifted and appraised observations drawn from a great variety of sources, and the result is a sort of encyclopedia, so arranged that new material can be incorporated with a minimum of disturbance of the text.

The book has three principal topics: weather, climate and landscape, considered as directly influencing the mental life of man. Weather and climate exert a 'tonic' influence; that is, they produce physical and chemical changes in the tension and metabolism of the nervous system and thus affect our 'mood'; landscape, on the other hand, exercises a 'sensory' influence, appeals to us by the way of perception. Weather may be defined as the aggregate state of the atmosphere and of the adjacent parts of the earth's surface at a given place and at a given point of time; climate, as a more or less regularly recurrent sequence of forms of weather; landscape, as the aggregate sense-impression produced by a portion of the earth's surface and the correlated extent of sky.

These topics are taken up in order. Beginning with weather, the author first discusses certain forms of weather which experience has brought into connection with mental 'tone'; thunder storms, hot-dry and hot-wet winds (föhn and sirocco), sultriness, snowstorms, change of weather (clearing up, clouding over, etc.), the tine just preceding an earthquake. He then proceeds to an analysis of weather into its elements, atmospheric and telluric. The former are temperature of the air (radiation of heat, cold and warmth of the air), movement, composition, humidity of the air, air-pressure, atmospheric electricity, and irradiation of the air (non-sensory effects of light and dark); the latter are temperature, movement (seasickness!), electromagnetism, composition and humidity of the underlying surface. Three chapters are then devoted to climate. Change of climate covers both variation of climate at a particular place and the 'change' attained by travelling (effects of arctic and subarctic climate; of tropical climate and of 'going south'; of inland and coastal, mountain and valley climates). The 'change of scene' often recommended by physicians works, as a rule, far less by direct climatic influence than by shift of interest, occupation, social relations, etc. (p. 173). An important chapter deals with psychical acclimatisation: habituation to a new climate; the permanent changes, intellectual and emotive, wrought by climate; and the induction of abnormal conditions, of psychoses and of neurotic and psychopathic states: the author writes impartially and with restraint, with full realisation of the sources of error besetting his subject. The final chapter discusses the relation of climate to mental periodicity. As regards the daily rhythm of the mental life,

this relation is exemplified in the alternation of sleep and waking, in the normal curve of depth of sleep, in the daily course of mental work, and in abnormal daily periods; as regards the annual rhythm, in the rutting time, in the periodicity of suicide, sexual misconduct and psychoses, in cyclopathic phenomena and the seasonal change of mood observable in 'nervous' individuals, in the oscillation of mental work, and in the conflict of personal with seasonal periodicity. A concluding section on 'astrophysical' phenomena says what there is to say about *Mondsucht* (somnambulism; cf. our 'lunacy'); refers briefly to the monthly periodicities of the sexual impulse,—not omitting the uncanny behavior of the *un* or *palolo* of the Banks Is.; ascribes the weekly variation of industrial performance to its non-climatic and non-sidereal conditions; and comments upon some alleged daily and yearly cycles,—the eleven-year sunspot period, the thirty-five-year period of climatic variation, Fliess's 23-day and 28-day cycles, and so forth.

From climate the author turns to landscape, and first to the elements of landscape: colors (red and yellow; green, blue, violet, purple; black, white, grey; phenomena of contrast and induction), forms (simple and complex; mass; direction; movement), and non-visual factors (tone and noise; smell; touch). In the case of touch, the distinction between the influence of landscape and that of weather and climate can hardly be drawn with any practical certainty; theoretically, it still obtains. The synthesis of landscape may be effected at very different mental levels. Its primitive mode is a synthesis by symbolisation, as when we think of an autumnal scene as portraying the death of the year, or endow the twilight landscape with our instinctive fear of darkness and solitude. The elementary process of assimilation plays but a small part in the synthetising of landscape; too much detail is given, in direct perception; but the given is often dissimilated (*e. g.* by the clouding over of the sun), whereupon a reassimilation occurs which may introduce a new and permanent synthesis. A characteristic form of assimilation, in our modern attitude to landscape, is 'moralisation' (*Ethisierung*); the scene is solemn, or majestic, or peaceful, not in an aesthetic sense; we are not here concerned with aesthetics; but in the sense of an externalisation of our moral sentiments. Lastly, the 'character' of a landscape, the structure that persists under all the changes of the seasons, may come to us by way of moralisation, in which case the word 'character' assumes something of its narrower and more special meaning, or may be raised by abstraction to the status of an 'ideal.'

Certain landscapes make a peculiar appeal; the author mentions the effect of sunlight, of wide prospect, of hill and valley, night, twilight, late autumn, exotic features. The appeal varies, again, with the age of the individual observer and with the epoch in which he lives. In general, the influence on national life—on usage, taste, belief—that is ordinarily attributed to natural environment, or to climate, or to geographical position, is far more a matter of 'landscape,' in the sense of the present book, than it is of climate in the proper signification of that term.

It remains to outline a programme for geopsychological work. The effect of landscape may be studied by suitably modified forms of the two methods now in use for the investigation of feeling and emotion: the method of expression, and the method of impression (self-observation and self-analysis). It is not permissible, in general, to draw conclusions from the effect of painted scenes to that of the natural landscape. Weather and climate may be approached, first, by the

method of physiopsychical inference: knowing, from scientific experience, that certain bodily conditions often evoke determinate mental phenomena, we may derive or deduce these phenomena from the bodily conditions presented to us; the method is, however, to be applied with great caution. The method of simple self-observation is indispensable. The statistical method is trustworthy only where its results can be submitted to a psychological analysis. Experiments can be made, both on weather and on climate. The best type of weather-experiment consists in the artificial induction of elements of weather, and the noting of their effect upon psychical and psychophysical processes; a comparative method, that should wait upon the changes and chances of the weather, would be less reliable. Climatic experiments, on the other hand, are best made comparatively; tests may be applied in different localities (change of climate) or in the same locality at different times of the year (variation of climate); these procedures may then be supplemented by the artificial induction of climatic 'fragments' (overheating of a room for some hours; excessive humidity maintained for several days). The methods of social psychology are not, for the present at least, available.—

So the book ends. It is a pioneer work, the first attempt at a systematisation of geopsychological facts. Dr. Hellpach has brought together a vast body of scattered observations; he has not found everything, but he has found a great deal; and he has given us a frame into which other observations may be fitted. He writes in a clear and popular style, with well-balanced judgment. The least satisfactory part of his work is, perhaps, the chapter on the synthesis of landscape; he is here dealing with psychological problems of great complexity, and the eighteen pages allotted to the subject are too few. The publication of the second edition in two volumes would permit a more nearly adequate treatment.

*Free Will and Human Responsibility. A Philosophical Argument.* By HERMAN HARRELL HORNE, PH. D. The Macmillan Company, 1912. XVI+197 p.

This work is eminently a study in Evolution, the development namely of man's subconscious self. What are we? Where are we? Whither are we bound? So many open questions and yet so much achieved truth. It is an interesting analytic because of its fairness and fullness. Seldom do we find a discussion of so great differences of opinion with so little austerity. Dr. Horne treats his antagonists with such marked courtesy we do not at once discover where the personal element comes in. Liberty men have fought for it in the objective world, "Shouting the battle cry of Freedom." Now comes the battle subjective. Do we verily possess what we have fought for? Is man provably the architect of his destiny?

Professor Horne gives us a series of discussions. He first shows that the same or at any rate analogous issues confront us in other fields. Man's knowledge is everywhere incomplete. In physics, biology, sociology, psychology, theology analogous antitheses appear. Then comes a history of man's achievement down through the ages, his gradual emancipation of himself as possessing freedom of choice, a virtual racial voyage of discovery. This is illustrated best in the religious world where the advancing ethics shows more and more man's consciousness of himself as responsible because originative, causal. Having reached the present problem the author takes up first the evidence that man is simply determined by heredity and environ-

ment. Answering the usual claims that man is absolutely the child of circumstance, he proceeds to give the grounds for recognizing man as possessor of genuine origination, quoting Kant and Fichte and others who have had a world wide influence, maintaining that man is indeed the architect of his destiny for all time.

The chief characteristic, not to say excellence of the work appears in its method. Professor Horne is an authority in pedagogy, and here he practices what he has preached. The *how* to think determines the *what* to think. We are reminded of the Platonic dialogue of which we have before us a modern development. Leaders in his classes were chosen who opened the way to a free battle between the opposing sides. After the class has in this way evoked the differences Dr. Horne gives the summing up, a virtual Hegelian synthesis, the union of opposites. The book is the result of his work in Dartmouth and dedicated to his former students for whom he shows a marked attachment. Freedom we are assured demands a free field, possesses an unlimited arena. As philosophical its discussion has to do with the results of science, and would properly follow Ethics, Psychology, Philosophy of Religion, or History of Philosophy. It is an elucidation rather than an exhaustion of facts. Some will wish that he had developed certain portions of the field more completely. But the outcome of his freedom has complete justification.

The synthesis of results seems to call for a more thorough going psychology of the Will, the bringing out of the relational development of voluntary and non-voluntary, the motive as an accepted preference (non-voluntary) freely allowed to rule over conduct, the purpose as a line of mechanical choices, yet dethronable at any point. Of course the Volition is not creation of energy, only self-direction of attention. Complete intellection would be required to balance complete freedom. But the work is not a Psychology. We take penalties for the race, penalties handed down from our ancestors. The relation of responsibility to knowledge and of penalty to responsibility are very carefully treated. To trace the development of humanity calls for a historical rather than a theoretical exposition. It is a pleasure to find so much facility where we have had so much dogmatism. Possibilities of free choosing involve unlimited variations of treatment. Some would emphasize Kant more. Still we have but to look critically and we encounter the influence of the critical philosophy. Perhaps we are able to peer into the writer's mental history, subconscious development. We certainly feel the import of the philosopher of Koenigsberg as we trace the author's psychical life. The limitations of science are recognized without mention of the critique of pure reason.

Science, history and immediate experience are the basal elements. While there is much that overpasses our comprehension there is a transcending pleasure in the vision of the universe so far as it is known and of man as the king of land and sea, man the veritable possessor of free will and responsibility. Yes, there is increasing pleasure in the conflict, the verification of the unsearchable, not to say divine capacity of the human unit. The open questions only add to the satisfactions of progress. Our Neo-Kantian professor, mindful of the limitations of the pure reason but as well of the postulates of the practical, bows his appreciation to the self-sufficient claims of the empirical pragmatists. Indeed we have in this volume clear verification of the power of our great thinkers upon the subconscious self of the writer. While there are unnumbered problems still to be solved the truths established give free lance to the attainable proofs that man

is verily the architect of his destiny. The thoughtful student will be likely to feel that the fundamental import of the book is virtually epistemology. G. CAMPBELL.

Dartmouth College.

*The Criminal and the Community.* By DR. JAMES DEVON. Introduction by Prof. A. F. Murison. John Lane Co., 1912. xiii: 348 pp. $1.75 net.

This study, while primarily of interest to sociologists, is a contribution in the field of social psychology. The author, Medical Official in Glasgow prisons, speaks with the authority of 16 years of contact with criminals of all classes. His knowledge of social conditions is equally immediate, seasoned by experience in the ranks of unskilled labour,—by having been in turn, apprentice, artisan, student, physician and man of science.

In treating the problem of the criminal, Dr. Devon applies the point of approach of modern psycho-pathology, that is, presentation of individual cases, extending over long periods. His method is environmental, in the large sense.

His problem is, in brief, first the nature of the criminal himself. The author dissents from Lombroso, finding no causal relation between physical characteristics and crime. Crime is an immediate social product, not an atavism. Here warning is sounded lest the student lose sight of the fact that in prison the individual is subjected to abnormal conditions. To make psychological generalizations is to confuse innate and acquired characters. The problem is individual.

Second, common factors in the causation of crime are taken up. Devon finds only a superficial relation between drink and crime. The great mass of the causal criminal curve falls in between the inequality of economic conditions and abnormal city crowding. Adolescence and crime are not causally related; the correlation appears because society leaves youth unprotected. Nor is crime an attribute of sex. Here the author follows the French, rather than the Italian school.

The third aspect of the problem is the treatment of the criminal, and here Devon makes his most brilliant contribution. He proves by commonplace cases, (1) that present methods have not prevented growth of crime, (2) that they have not been designed to reform, (3) that failure has resulted because treatment is not based on recognition of social conditions as they exist. Prison should be merely the link between detection of maladjustment in the individual to his environment, and application of scientific probation. There is only one principle in penology, that is to study and to treat the individual in relation to his environment (p. 339).

Dr. Devon's study is a departure from stereotyped schools. His successful application of the environmental method is a pioneer achievement in criminology. MIRIAM VAN WATERS.

*The Origin and Development of the Moral Ideas.* By EDWARD WESTERMARCK. Vol. ii., 1908. New York, The Macmillan Co. pp. xv., 852. Price $3.50 net.

The first volume of this important work, which appeared in 1906, was reviewed in the JOURNAL, vol. xxi., pp. 334 ff.; the theory of the moral consciousness which the author represents was there set forth, and the plan of the whole undertaking was indicated. That plan involved the detailed study of six typical modes of human conduct. The first mode "includes such acts, forbearances and omissions as directly

concern the interests of other men, their life or bodily integrity, their freedom, honour, property, and so forth"; its discussion fills the second half of vol. i. and the first seven chapters of vol. ii., and ends with a consideration of the origin and development of the altruistic sentiment. The second mode, covering suicide, temperance, asceticism, —acts and restraints which chiefly concern a man's own welfare,—is discussed in the five following chapters of the present volume. The third, referring to the sexual relations of man, occupies four chapters. The fourth, which requires a single chapter only, is the conduct of man to the lower animals. The fifth, conduct towards dead persons, takes two chapters. The sixth and last, conduct towards beings, real or imaginary, that are regarded as supernatural, fills six chapters. A concluding chapter recapitulates the author's theory of morality, and gives his forecast of the future. "We have every reason to believe that the altruistic sentiment will continue to expand and that those moral commandments which are based on it will undergo a corresponding expansion; that the influence of reflection upon moral judgments will steadily increase; that the influence of sentimental antipathies and liking will diminish; and that in its relation to morality religion will be increasingly restricted to emphasizing ordinary moral rules, and less preoccupied with inculcating special duties to the deity." A list of authorities quoted and a full subject-index bring the volume and the whole work to an end.

Dr. Westermarck's position, as we may remind our readers, is that "the moral concepts, which form the predicates of moral judgments, are ultimately based on moral emotions," and that these emotions "belong to a wider class which may be described as retributive; that moral disapproval is a kind of resentment, akin to anger and revenge, and that moral approval is a kind of retributive kindly emotion, akin to gratitude." The moral emotions have an alogical basis: "our retributive emotions are always reactions against pain or pleasure felt by ourselves"; but at the same time "the influence of intellectual considerations upon moral judgments is naturally very great" and, as we have seen, promises to become still greater. This position was worked out in vol. i.; and the present volume adds nothing to it, on the side of ethical theory; the new chapters simply illustrate and confirm, from fresh points of view, the doctrines already enunciated. The reviewer, therefore, has only to add that the treatment here is as erudite and as impartial as it was before. So far as ethnological evidence is concerned, the author has fully made good his claim that no "other theory of the moral consciousness has ever been subjected to an equally comprehensive test."

*La psychologie animale de Charles Bonnet.* Par E. CLAPARÈDE. Geneva, Georg et Cie. 1909. pp. 96.

The psychology of the Genevan naturalist and philosopher, Charles Bonnet (1720-1793), has been discussed in some detail by Offner (1893) and Speck (1897). The present memoir, published on the occasion of the jubilee of the University of Geneva (1559-1909), deals with Bonnet only as a comparative psychologist. After a sketch of his subject's life and work, Professor Claparède devotes three chapters to his views of the mind of animals, instinct, and the capacity of adaptation to a changed environment. The following chapters discuss Bonnet's ideas regarding maternal love in animals, the comparative intelligence of man and the lower animals, and the 'personality' of creatures, like Hydra and Lumbriculus, whose severed parts may regener-

ate the complete organism. A few pages are given to the philosophical flights of the *Palingénésie*, which the author regards as a sort of defensive reaction on Bonnet's part, due to his need of reconciling the cruelty of nature and the all-goodness of the Creator; and the memoir ends with a lucid summary.

Bonnet—who, it may be noted, employs the terms *experimental psychology, psychophysical,* and *psychometer* a century before Fechner appears upon the scene—was essentially an observer, anti-anthropomorphic and anti-teleological, faithfully concerned with facts. His system, so far as he is systematic, is a psychophysical parallelism couched in the traditional terms of dualistic interactionism. He would willingly have dispensed with the notion of mind, and have spoken solely of phenomena of irritability; but mind proved to be indispensable, and accordingly plays its part in his exposition. Nevertheless, Bonnet never seeks to explain by reference to end. "One may say that, in his view, mind reigns, but does not govern. It signs the decrees which the body submits to it in the form of needs, so as to validate them and make them mandatory; but that is all; it never intervenes as a foreign power in the determinations of the body." Bonnet thus has nothing in common with neo-vitalism.

Historically, Bonnet is one of the first students of animal psychology who added experiment to simple observation. His influence upon his contemporaries was large; he inspired much of the work of François and Pierre Huber. His scientific attitude and his positive achievement make his work worthy of study at the present day.

A two-color crayon portrait of Bonnet (perhaps by Michel Liotard), with his signature of 1777, forms the frontispiece of the memoir. Professor Claparède is to be congratulated upon this interesting and useful contribution to the commemorative publications of his university.

*The Theory and Practice of Technical Writing.* By S. C. EARLE. New York, The Macmillan Company, 1911. pp. vii., 301. Price $1.25 net.

This little book is intended for engineers; but its usefulness will extend beyond the engineering school. Advanced students in all the sciences are called upon to prepare 'short reports' and 'short and longer treatises,' to express themselves in description, narrative, and the writing of directions, and to submit manuscript to the printer. Professor Earle discusses his subject, both from the theoretical and from the practical side, with admirable clearness and brevity; pt. i., a study of the principles of logical structure, and pt. ii., on the practical application of these principles, occupy respectively just under and just over a hundred pages. An Introduction, of 16 pp., deals with the nature of technical writing, methods of study, and opportunities of training; and a Conclusion, of 10 pp., with methods of writing. A sixty-page appendix furnishes illustrative examples. The work may be heartily recommended. E. B. T.

*Life's Basis and Life's Ideal: the Fundamentals of a New Philosophy of Life.* By RUDOLPH EUCKEN. Translated by A. G. WIDGERY. London, A. & C. Black; New York, The Macmillan Co., 1911. pp. xxii., 377. Price $2.50 net.

*Present Philosophical Tendencies. A Critical Survey of Naturalism, Idealism, Pragmatism and Realism, with a Synopsis of the Philosophy of William James.* By R. B. PERRY. New York and London, Longmans Green & Co., 1912. pp. xv., 383. Price $2.60 net.

*William James and Other Essays on the Philosophy of Life.* By J. ROYCE. New York, The Macmillan Co., 1911. pp. xi., 301.

*Three Philosophical Poets: Lucretius, Dante and Goethe.* By G. SANTAYANA. Cambridge, Harvard University, 1910. pp. viii., 215.

Professor Eucken of Jena, who was awarded a Nobel prize for literature in 1908, is one of the best known of contemporary German philosophers. He is to be classed with men like Kuno Fischer and Paulsen rather than with the systematists in philosophy, and while he writes from ripe experience and full knowledge, his work is most valuable, perhaps, as the expression of a noble and many-sided personality. The present volume—a translation of *Die Grundlinien einer neuen Lebensanschauung,* published in 1907—sets forth the author's theory of Activism, which maintains that "the basis of true life must continually be won anew;" "only through ceaseless activity can life remain at the height to which it has attained." The book, although not technical, is by no means easy reading, and the translation is unnecessarily heavy. For the assistance of non-philosophical readers the translater has prefixed a useful Introductory Note, which gives the main outlines of Professor Eucken's position, and relates it to current modes of philosophising. Such readers may also be recommended to approach Eucken by way of Boyce Gibson's little work, "Rudolph Eucken's Philosophy of Life."

Professor Perry's volume contains a critical discussion, based in part upon articles already published, of the present philosophical tendencies which may be grouped under the headings of Naturalism, Idealism, and Realism. From this he passes to a constructive exposition of his own realistic doctrine: theory of mind, theory of knowledge, philosophy of life. The most interesting chapter, to the psychologist, is that entitled A Realistic Theory of Mind, where he may discover how psychological methods appear when viewed through the prism of a realistic philosophy. An introduction treats of the relation between philosophical theory and established belief, and of scientific and religious motives in philosophy; and an appendix reprints an essay on The Philosophy of William James.

Professor Royce's new book consists of five essays: William James and the Philosophy of Life, Loyalty and Insight, What is Vital in Christianity, The Problem of Truth in the Light of Recent Discussion, and Immortality. Its most important sections are, perhaps, those which discuss the theory of truth (Essay IV., pp. 233 ff.). The remaining essays break no new ground, though they are welcome as throwing light upon various points of Royce's system.

Professor Santayana's studies, based on lectures delivered at Harvard and Columbia Universities and at the University of Wisconsin, are interpretative rather than critical; that of Lucretius is, in the opinion of the present writer, the most successful of the three. Limitations of space, and the definite scope of the JOURNAL, must be the reviewer's apology for this casual and belated reference to a charming book.

*Increasing Human Efficiency in Business: a Contribution to the Psychology of Business..* By W. D. SCOTT. New York, The Macmillan Co., 1911. pp. v., 339. Price $1.25 net.

*Human Efficiency: a Psychological Study of Modern Problems.* By H. W. DRESSER. New York and London, G. P. Putnam's Sons, 1912. pp. xi., 387.

Both of these authors derive their psychology from certain passages in the writings of the late Professor James; both begin their exposition with references to Taylor and Scientific Management; and both exalt Efficiency as a personal and social ideal of living. Professor Scott, however, sticks closely to business; Dr. Dresser takes a wider range. The former discourses of Imitation, Competition, Loyalty, Concentration, Wages, Pleasure, Love of the Game, and Relaxation as means of increasing human Efficiency, of Rate of Improvement in efficiency, of the welding of Theory with Practice, of the Formation of Judgments and Habits,—the various topics being set forth in brief paragraphs (probably to secure relaxation) interspersed with italicised summaries (to secure concentration). The book is less a contribution to the psychology of business than a reading of certain business principles and results in the light of a highly schematic psychology.

Dr. Dresser teaches that "efficiency in the largest sense is a synonym for the art of life, for adaptation to nature." Psychologically, his acceptance of this ideal leads him "to restore the will to its proper place in contrast with recent interest in suggestion and the subconscious;" ethically, it leads to the doctrine of self-realisation. The keynote of the book is the writer's insistence on the possibility of conscious control. "Bundles of tendencies we surely are;" but "for every man who wills to become highly efficient there is a way to acquire inner control, to master habits, wasteful emotions, troublesome moods, and all other adverse mental states;" "the rational way to think is with reference to the consistent, ideal self we will to become, the self which life is ready to develop in us." Dr. Dresser tends to a homiletic style, and does not always escape the danger of platitude ("He who loves his work will find a way to do it well;" "Time settles many matters which persistent thought could not solve"). He has extended the meaning of efficiency to include moral and spiritual values; yet the suggestion of industrial efficiency is always present; and the reader, puzzled by the many shifts and enlargements of reference, will probably hold fast to that as the type of efficiency in general. The reviewer is persuaded that Efficiency is not the goal of human living. But, be that as it may, the author would do well to bear in mind the procedure of that Socrates whom he praises as the "pioneer of precise thinking," and to pay more regard to definition and induction.

*A Text-book in the Principles of Education.* By E. N. HENDERSON. New York, The Macmillan Co., 1910. pp. xiv., 593. Price $1.75 net.

*Outline of a Course in the Philosophy of Education.* By J. A. MACVANNEL. New York, The Macmillan Co., 1912. pp. ix., 207. Price 90 cents net.

Professor Henderson discusses the principles of education under the three headings Education as a Factor in Organic and Social Evolution, The Process of Education in the Individual, and The Educational Agencies. The treatment throughout is frankly teleological, and mind, conscience and all the higher powers of the individual are treated from the utilitarian point of view. At the same time, the author makes it clear that successful practice is not the be-all and the end-all of human living; there is room for idealistic philosophy; and "education in a democracy means a vocational training for each and

liberal culture for all." The Idealism of Service cannot, by some of us, be accounted the last word of philosophy; and the inability of final causes to explain might have been set forth in greater detail. Within his self-imposed limits, however, Professor Henderson writes with commendable clearness and thoroughness.

Professor MacVannel's *Outline*, a revised and somewhat unevenly expanded syllabus prepared originally for the use of his students in the classroom, is intended to aid the reader in following a course of lectures on the subject and, more generally, in systematising the knowledge that he may have acquired. The author's philosophy appears to be humanistic, his science evolutionary and finalistic, his psychology dynamic, and his education social. The forty section-headings of the syllabus will, no doubt, help the beginning student to pigeon-hole facts and theories.

*La crise de la psychologie expérimentale: le présent et l'avenir.* Par N. KOSTYLEFF. Paris, F. Alcan, 1911. pp. 176.

The book opens with destructive criticism. Experimental psychology has worked at random; it is wholly unable to reduce its results to a system of knowledge; it has, indeed, no results of importance to show. Psychophysics, physiological psychology, psychometry have all alike followed blind paths that lead them nowhere. The synthesis offered by Toulouse, Piéron and Vaschide is clear but jejune; that offered by Titchener is full but imperfect. Binet was on the right road in his study of intelligence, but he ends, after all, with a series of practical tests which take him far away from psychology. The Würzburg school has shown an increasing tendency. to metaphysical speculation.

What shall be the remedy? The great mistake of experimental psychology has been to take its subject-matter statically and not dynamically. All mental processes—we catch hints of this position in the work of Mach, Wahle, Bourdon, Nuel—must be regarded as complexes of cerebral reflexes; all the rich variety of the mental life must be explained by the composition of these reflexes. Pawlow, and more especially Bechterew, have pointed the way to an objective psychology; Berger and Anderson, Girard and Frédéricq, have thrown light on the physiology and physical chemistry of the brain-reflex. We must combine Bechterew's procedure with that of introspection, and must work genetically; children must be brought together in psychopaedological institutes for systematic examination. The study of words will tell us when the first true 'image' appears; we may then go on to ask which appears first, object-image or quality-image, substantive or adjective, heterosensory or homosensory reflex-groups; and so we may pass to the earliest judgments, to memory and association, to abstraction, to wordless or imageless thinking, to reasoning, to attention. We shall thus obtain a psychology that is both objective in its grounding and outlook and systematic in its scope and presentation.

So the author. Criticism is wholesome; and his criticism of experimental psychology contains, no doubt, a measure of the truth. It loses a good deal of effectiveness, however, when we realize that M. Kostyleff has a hobby of his own; that he would confine the science to what is now one of its many directions, and tie it down to a certain plan and a certain method that now have many rivals. Clearness of thought is a great virtue, and psychology can only profit if this theory and point of view are carried to their logical conclusion and thoroughly tested by experiment. Meanwhile, the book will not alarm those who are trying to clarify and to systematise on other principles.

E. B. T.

# BOOK NOTES

*The Theories of Evolution.* By YVES DELAGE, M. D. and MARIE GOLDSMITH. Tr. by André Tridon. New York, Huebsch, 1912. 352 p.

This is an excellent and concise statement of the present condition of the problems of evolution. First come the fore period and that represented by Darwin, although most of the chapters are post-Darwinian. The topics since Darwin that are treated here are natural and sexual selection, theories of heredity, Spencer's units, Nägeli, DeVries, Weismann, germinal selection, Roux, Galton, Mendel, transmission of acquired characters, theories, observations and experiments, Lamarckians, organic selection, isolation, orthogenesis, mutation. Everything is clear and concise, though perhaps a little simple and elementary. It is somewhat to be regretted that the book contains so very few references to literature on the subject.

*The scope of formal logic.* By A. T. SHEARMAN. London, University of London Press, 1911. 165 p.

This comprises five chapters as follows: explanation of terms, variation of symbolic procedure, examinations of properties in generalized logic, general logic and the common logical doctrines, general logic as the basis of arithmetical and geometrical processes, philosophical treatment of number and of space.

*Die Abstammungslehre: eine gemeinverständliche Darstellung und kritische Übersicht der verschiedenen Theorien mit besonderer Berücksichtigung der Mutationstheorie.* Von P. G. BUEKERS, Leipzig, Quelle & Meyer, 1909. 354 p.

This is a general survey of the subject of descent and is designed to be both popular and critical, setting forth special theories but with most reference to mutation. The main chapters are historical, propagation, systematics, variability, purposiveness and adaptation, natural and artificial selection, unpurposiveness, auxiliary theories (under which are included sexual selection, correlation, variations, Nägeli's perfection theory, animistic notions like Haeckel's and germinal selection), criticism of adaptation theory, sexual increase and death before maturity, limited action of selection, mutation and selection, a glance into the development-history of living nature.

*Uber den Willensakt und das Temperament.* Von NARZISS ACH. Leipzig, Quelle & Meyer, 1910. 324 p.

This is a very careful series of experimentations, by the man who now happily occupies the chair of Kant in Königsberg, upon the will. He caused a series of impressions to become habitual if not merely memorized and then his subjects by an act of will had to break in upon the series in various ways and introspect. We have then here a closer ranged view of the processes of will than hitherto, which sheds very much new light. Though the work as a whole is perhaps not so interesting as the author's original study of will, it is nevertheless

of great interest and significance. It would not be surprising if the most valuable part of it all proved to be what he has to say at the end concerning feelings as involved in the acts upon which his experiments were directed.

*Empfindung und Denken.* Von AUGUST MESSER. Leipzig, Quelle & Meyer, 1908. 199 p.

This is a very interesting study. It begins by discussing the sensory elements in outer perception and then tries to delineate the thought elements in it, then passes to inner perception, attention and abstraction, sentence and judgment, lapse of thought and knowledge, psychological and logical discussions of thought and finally, the pedagogical implications of all this.

*Die Grenzwissenschaften der Psychologie.* Von W. HELLPACH. Leipzig. Dürr, 1902. 515 p.

The author first treats the anomaly of the nervous system, then animal phsiology, neuropathology, psycho-physiology and developmental psychology. It was well indeed, now that psychology is narrowing down and particularly laboratory psychology is drawing in its phylacteries, to have psychologists at least instructed upon the boundaries of their kingdom on all sides. This is what this writer attempts to do and very properly dedicates his work to Wundt.

*Handbook of mental examination methods.* By SHEPHERD IVORY FRANZ. New York, The Journal of Nervous and Mental Diseases Publishing Co., 1912. 165 p. (Nervous and Mental Disease Monograph Series, No. 10.)

This work discusses sensation, movement, speech and aphasia, attention, apprehension and perception, memory, association, time of mental processes, general intelligence and examination, methods of dealing with observational data.

*Das Problem der objectiven Möglichkeit: eine Bedeutungsanalyse.* Von AUGUST GALLINGER. Leipzig, J. A. Barth, 1912. 126 p. (Schriften der Gesellschaft für psychologische Forschung. Heft 16, IV Sammlung.)

The author discusses here connections of being positive and negative, the idea of ground, especially of knowledge. After discussing the idea of objective possibility, he distinguishes and discusses separately its empirical, regulative, concrete, abstract and hypothetical possibility, contrasting possibility and impossibility.

*The economy and training of memory.* By HENRY J. WATT. Second Impression. London, Edwin Arnold, 1909. 128 p.

The best chapter in this little book is the author's account of the experimental investigation of memory, the factors which influence it and mental imagery. The book shows a pretty good knowledge of the many experiments in memory during the last twenty-five years.

*Logik der reinen Erkenntnis.* Von HERMANN COHEN. Berlin, Bruno Cassirer, 1902. 520 p.

After an introduction, the chief topics here are the judgments of the thought processes, especially the judging of original identity and

contradiction. Then come the judgments of mathematics, such as reality, plurality, universality, then of the mathematical sciences, substance, law, idea and finally, judgments of method, *e. g.* possibility, reality, interest and limitation.

*Beauty, ugliness and other studies in psychological aesthetics.* By VERNON LEE and C. ANSTRUTHER-THOMSON. New York, John Lane Company, 1912. 376 p.

The writer begins with anthropomorphic aesthetics, then discusses its empathy, its organic accompaniments, then passes to its central problem as represented by Münsterberg, Titchener and the Würzburgers. Beauty and ugliness are next considered and then aesthetic responsiveness in its variations and accompaniments based on the author's own experiences.

*Psychophysik.* Von W. WIRTH. Leipzig, S. Hirzel, 1912. 522 p.

This memoir which very fittingly comes from Leipzig is the most comprehensive and as it ought to be, by far the most valuable treatment of its subject for many years. The author treats of the methodic questions including self-observation and experiment, quantitative and qualitative analysis, then takes up auxiliary aids from the domain of collective Masslehre, then the methods of reproduction which is really the best part of the book and finally, treats of the reaction method.

*Chapters from modern psychology.* By JAMES ROWLAND ANGELL. New York, Longmans Green & Co., 1912. 308 p.

This volume contains lectures at Union College early in 1911. The matter is arranged for a general college audience and the author treats in his eight lectures of general, physiological, experimental, abnormal, individual and applied, social and racial, animal and finally general genetic psychology, with a retrospect.

*Aristoteles ueber die Seele.* Neu übersetzt von ADOLPH BUSSE. Leipzig, Felix Meiner, 1911. 120 p. (Philosophische Bibliothek, Band 4.)

*Ascétiques et mystiques.* Par ABBÉ JEAN DELACROIX. Paris, Bloud & Cie, 1912. 61 p. (Questions théologiques.)

*Fatigue.* By F. L. WELLS. Reprinted from the Psychological Bulletin, November, 1911. Vol. 8, No. 11, pp. 390-395.

*Ueber den Traum: experimental-psychologische Untersuchungen.* Von J. MOURLY VOLD. hrsg von O. Klemm. Zweiter Band. Leipzig, J. A. Barth, 1912. pp. 449-879.

The second volume begins with the fourth section and is devoted to non-experimental and normal dreams where the author continued his method of investigating the upper extremities, especially stimulating the right and left hands. He also makes some interesting conclusions in the last section concerning the relation of dreams to various conditions and what the elements are which enter into their composition, discussing incidentally dreams of floating and hovering, dreams of dreams and speech in dreams.

*Die Seele des Kindes.* Von W. AMENT. Stuttgart, Franck, 1911. 93 p. (Dritte, verbesserte Auflage.)

This is a rather copiously illustrated story of child life which embodies various previous works of the author and covers the entire period from birth to well rounded adolescence.

*Uber die psychologischen Theorien Freuds und verwandte Anschauungen, Systematik und kritische Erörterung.* Von ARTHUR KRONFELD, Leipzig, Wilhelm Engelmann, 1912. 120 p. (Sammlung von Abhdlgn zur psy. Pädagogik aus dem Archiv für die gesamte Psychologie, hrsg. von E. Meumann. III. Band—I. Heft.)

This is by far the most searching study that has ever been made of the Freudian precepts. The first part is taken up with an exposition which is a model of condensation and lucidity. The second part is devoted to criticisms. The latter are directed mainly against some of Freud's mechanisms but the chief fault found is with the clearness and consistency of his basal philosophical principles. Most of these points seem to the writer of this review well taken, but it should not be forgotten that Freud is not a philosopher; but that he has made all his most epoch-making new departures on the basis of a very prolonged and wide-ranged clinical experience and that he has had the insight and sagacity to penetrate into the meaning of these cases in a way that has shed new light upon the structure and functions of the human soul.

*Criminal responsibility and social constraint.* By RAY MADDING MCCONNELL. New York, Charles Scribner's Sons, 1912. 339 p.

The first part is devoted to the aims of punishment, viz., expiation, retribution, deterrents, reform and social utility; part second to freedom in crime, psychology of will, motive and choice, mental causation, freedom which is identified with ignorance of causes, determinism assumed in daily life and in science, the testimony of self-consciousness, freedom or absence of external constraint, character and environment, transcendental freedom. The third part is devoted to responsibility for crime and treats of early extremes and present practices, arguments for complete irresponsibility, contrast of moral considerations and social expediency, the basis of personal accountability and of social constraints and practical procedures.

*Nervous and mental diseases.* By ARCHIBALD CHURCH, M. D., and FREDERICK PETERSON, M. D. Philadelphia, W. B. Saunders Co., 1911. 932 p. (Seventh thoroughly revised edition.)

It is very creditable to the medical profession that this valuable work has reached already a seventh edition and to the authors that it has been thoroughly revised by over 150 interpolations of varying lengths. Five important chapters have been largely rewritten and the various recent theories of the nature of hysteria have been outlined.

*The biology of physa.* By JEAN DAWSON. Behavior Monographs, vol. 1, No. 4, 1911. Serial No. 4, 120 p.

This is a very interesting and valuable paper and the result of a great deal of very painstaking work. The author first discusses the relation of the freshwater snail to its natural environment, then the

mucus and the mucous threads of physa, then its food and food activities, then its respiration and finally, describes some psychic phenomena.

*The evolution of vertebrates and their kin.* By WILLIAM PATTEN. Ill. Philadelphia, P. Blakiston's Sons & Co., 1912. 486 p.

This author has spent many years in teaching and studying biology and all this time has been possessed with the idea of uniting the branches of the animal kingdom into a natural coherent system or genealogical tree that would indicate the rise and decline of the important functions and organs and map out the highway of organic evolution and even assign in biological terms the approximate days and surroundings for the critical events, etc. The main point here is to discover which one, if any, of the many existing invertebrate phlya form the trunkline of descent from the lowest vertebrates to the coelenterates and through them to the protozoa. The author holds the McNard theory of the origin of vertebrates and gives this considerable space in the first chapters of his book which—although it is hardly in the line of this journal to discuss in detail—appears to be one of very great interest and significance which every genetic psychologist will greatly profit by knowing.

*Prehistoric man.* By W. L. H. DUCKWORTH. New York, G. P. Putnam's Sons, 1912. 156 p. (The Cambridge Manuals of Science and Literature.)

The ground covered by this little book is the precursors of paleolithic man, alluvial deposits in the cave, associated animals and implements, human fossils and the geological chronology, human evolution in the light of recent research. This seems to be a very sensible and condensed little finder and it has an excellent collection of literature.

*A new logic.* By CHARLES ARTHUR MERCIER. London, Heinemann, 1912. 422 p.

The author premises that his professional brethen will look askance upon a physician who wastes his time on logic and that logicians will regard him "with the contemptuous abhorrence that is bestowed all the world over by professionals upon the amateur." He certainly does go his own way regardless of the logic of schools, treating first the proposition, its nature, meaning, kinds, constitutions, ratio, terms, their origin and kinds, a new doctrine of quantity with particular distributive rules, the individual, the single, intensive, comprehensive quality, including classification, negative terms and modes of denial. The second book is devoted to empirical reasoning, the indirect appeal to experience, imperfect induction. The third book is on the methods of explication involving the laws of thought, the canons of inference, the implications of simple and compound propositions, faults of the rules of a syllogism, conditional proposition and its implication. The fourth book is on analogy, composite reasoning, fallacies and the faults of the existing systems, while the appendix contains a suggestive note upon the classification of sciences.

*Syphilomanie et syphilophobie.* Par ALEXANDRE MOVRAN. Paris, Henri Jouve, 1909. 70 p.

Syphilis has a moral affect upon sound people and many more who are affected by it. Each deserves to be a special mental syndrome or

rather two of them. The first this writer calls syphilomaniacs who have a certain indemnity for the disease when it comes and often take refuge in hospitals and retreats. Their mental state is more or less carefully attended and may or may not be cured. On the other hand, syphilophobiacs are syphilitics and their phobia may be transient or permanent. The individual reaction is measured by the intensity of the emotivity. One variety of these phobiacs are altruists, but these are not discussed here. This phobia can impel to suicide or crime. Both manias and phobias are sometimes an extension in the nervous field of neuropathic heredities of various kinds, although sex and profession have less influence. The reputation of vareole on which quacks pronounce is the chief generator of this phobia. Treatment should be general and social prophylaxis with instruction for the masses, distinguishing between what is to be feared and what is not. Individual treatment ought to be attempted, but the nervous therapeutics is rather limited. Travels, substitution of a mania, pardon, consolation, encouragement are indicated.

*La formation directe du raisonnement chez l'enfant.* Par M. GUÉCHOT. Paris, Hachette et Cie, 1909. 45 p.

This little book discusses the following subjects: how the infant comes to know its senses, attention, reflection, direct observation and the rôle of consciousness, the sources of sensation, objects and the actions essential in an object, the essence of action, how and why, the elements of teaching French and intellectual formation, the rôle of grammar, the importance of reading in relation to the development of attention and the formation of reason, direct observation and internal observation, moral education.

*Edgar Poe.* Par ÉMILE LAUVRIÈRE. Paris, Bloud et Cie, 1912. 252 p. (Les Grands Écrivains Étrangers.)

This monographical study gives the life of Poe and connects it at each point with his works. The author has evidently made a very careful study and discusses his theory and gives an interesting account of the genesis of the terror he expresses in the Raven, with interesting side remarks on fear. His heredity he finds to be very wretched, his youth irregular, his works only partly sane and his death premature and miserable.

*Die nervösen Augstgefühle.* Von THOMAS MAINHARDT. Leipzig, Wendel, 1908. 128 p.

The writer first discusses the nature and origin of the various conditions of anxiety, the modes of avoiding fear, anxiety about witches, anxieties connected with the heart, diseases, with callings, heredity, sex anxiety caused by things heard and shown, agoraphobia, certain neurasthenic feelings of anxiety, the natural methods of healing, gymnastics and Turnen, and the hypnotic processes.

*Les localisations célébrales: esquisse méicale et psychologique.* By JEAN FERRAND. Paris, Rousset, 1911. 87 p.

This is a rather severe arraignment of present theories and methods of determining cerebral localization because it has a materialistic moral. The precipitant tendency to utilize anatomical, clinical and physiological facts for the determination of problems that are essentially metaphysical is wrong. Condemnation of the theory of images and the doctrine of the associationist seems a real triumph of the old spiritualistic philosophy which will survive all attacks.